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ABSTRACT

This material includes student guide sheets, reference material, and tape script for the audio-tutorial unit on uplands. A set of 35mm slides and an audio tape are used with the materials. The material is designed for use with Connecticut schools, but can be adapted to other localities. The materials consider types of uplands, ecology of uplands, use of uplands, and human impact on uplands. (RH)

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UPLANDS

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UPLANDS

AND

LAND USE DECISION MAKING

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GUIDE SHEET #1

Welcome to the audio-tutorial unit on Uplands. Before listening to the tape provided with this unit, please read the list of objectives for this unit. When you have completed that task, put slide #1 in the slide viewer, and turn on the tape recorder.

OBJECTIVES: At the completion of this audio-tutorial unit - Uplands, you should be able to:

1. Describe uplands in terms of their biological and geological components, and be cognizant of their relationship to inland and coastal wetlands.
2. Describe forests, farms, pastures, orchards and nurseries as types of upland areas.
3. Justify the value of upland areas as recreational areas, wildlife habitat, providing scenic diversity and educational resources.
4. Recognize the ecological structure, stability, and regenerative capacity of such upland areas as forests and farms.
5. Describe the role of upland forests and farms in flood control and maintaining water quality.
6. Describe how upland vegetation helps alleviate air, water, and noise pollution.
7. Discuss critically the past, present and possible future impact of human activity on upland areas.
8. Prepare a list of values and principles relating the importance of uplands and how they benefit all of us.
9. Measure and interpret the critically important economic role of farms as producers of perishable crops, dairy products and livestock for local consumption.

Before beginning the Upland A-T Unit assemble the following

from the kit

Uplands cassette tape
Uplands 35mm slides
guide sheets

on your own

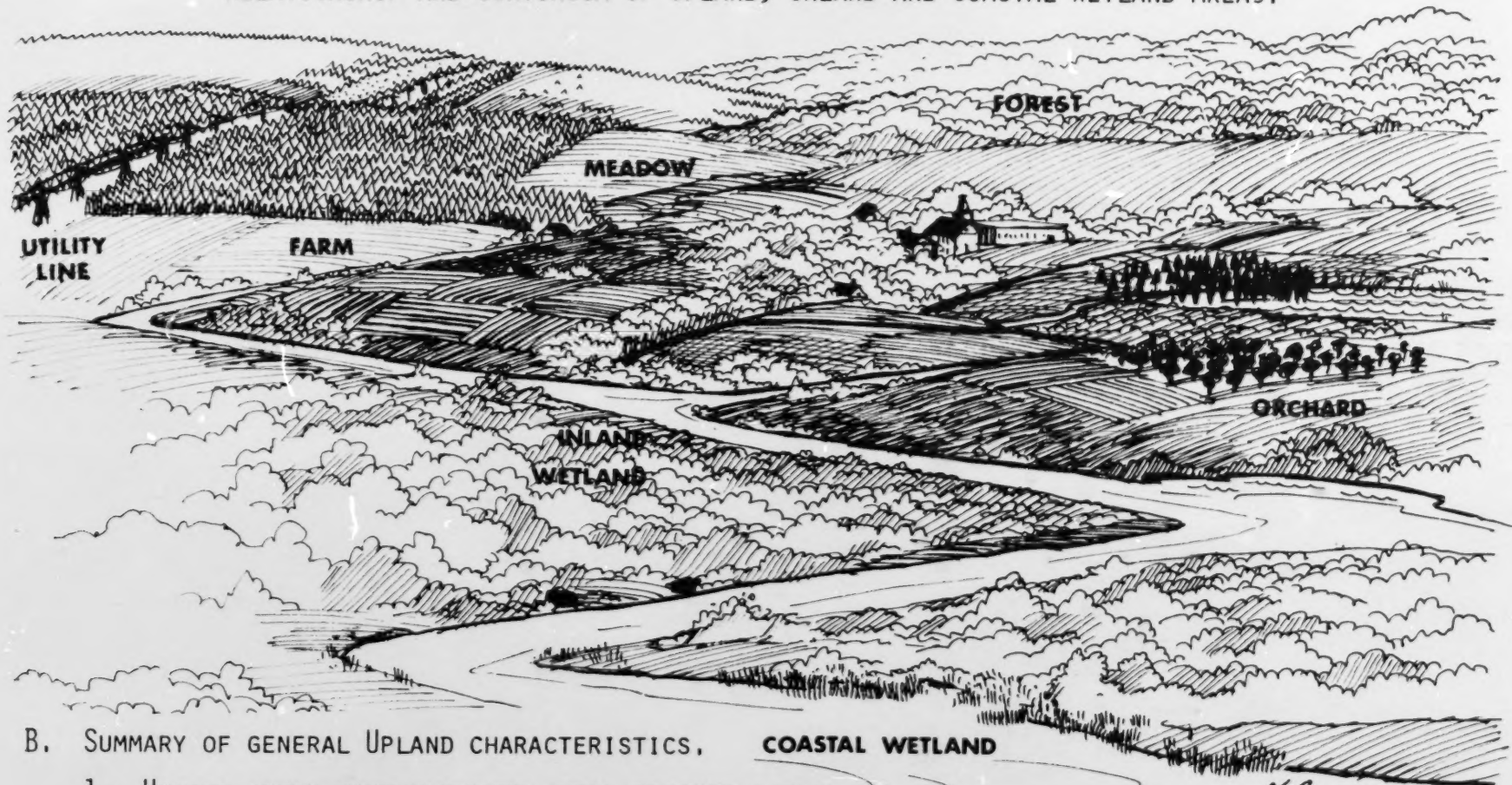
pencil
scrap paper

Place the tape for Uplands in your recorder and put slide #1 in the slide viewer. Now procede with the A-T Unit!

BE A RECYCLER YOURSELF. WRITE YOUR COMMENTS, NOTES, AND ANSWERS ON SCRAP PAPER INSTEAD OF THESE GUIDE SHEETS. IN THIS WAY, THESE GUIDE SHEETS WILL BE AVAILABLE FOR THE NEXT PERSON IN YOUR COMMUNITY WHO WILL BE MAKING USE OF THIS UNIT.

GUIDE SHEET #2

RELATIONSHIP AND CONTINUUM OF UPLAND, INLAND AND COASTAL WETLAND AREAS.



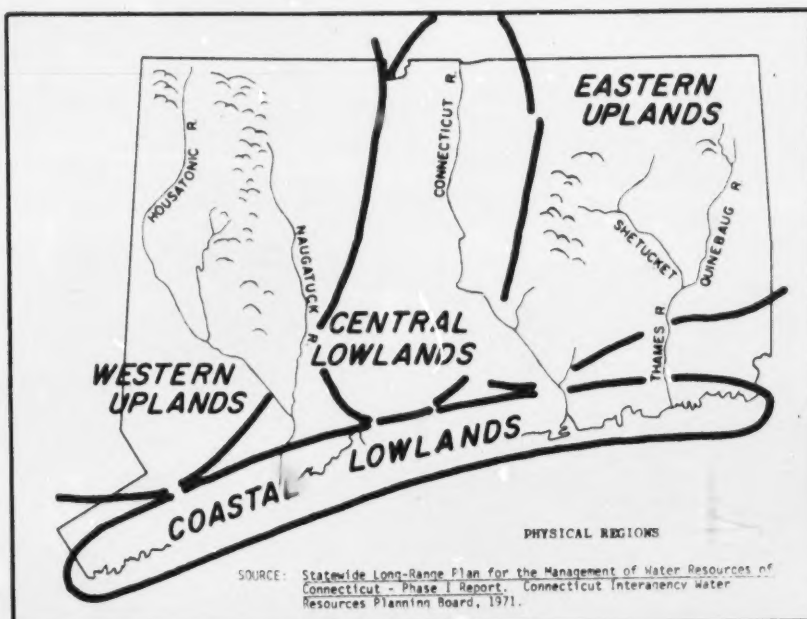
B. SUMMARY OF GENERAL UPLAND CHARACTERISTICS, COASTAL WETLAND

1. UPLAND AREAS HAVE ELEVATED, WELL DRAINED SOILS.
2. UPLAND AREAS INCLUDE ANY AND ALL TYPES OF TOPOGRAPHY OTHER THAN WATER FILLED DEPRESSIONS.

*IF YOU WANT MORE TIME TO STUDY THIS GUIDE SHEET, TURN OFF THE RECORDER...WHEN YOU ARE READY, TURN THE RECORDER BACK ON.

A.

GUIDE SHEET #3



B.

UPLANDS AND THEIR USES

On this section of the guide sheet, we have constructed a list of some upland areas along with descriptions of the potential role the upland fulfills. Rate each role or usage pattern in terms of its value to you.

Upland Type	Role of Usage Pattern	Value of Use (check one)		
		vitaly important	moderately important	limited importance
Forest	recreation.....			
	open space.....			
	watershed.....			
	aesthetic.....			
	forest products.....			
	(lumber, paper)			
	prevention of			
	soil erosion.....			
	absorption of			
Farm	water pollutants.....			
	absorption of			
	air pollutants.....			
	wildlife habitat.....			
	food production.....			
	open space.....			
	recreation.....			
	watershed.....			
	aesthetic.....			
Utility Right of Way	prevention of			
	soil erosion.....			
	pollution filter.....			
	wildlife habitat.....			
Parks and Recreation Areas	energy.....			
	wildlife habitat.....			
	aesthetics.....			
	recreation.....			
	open space.....			

After you have finished this activity return to the narrative. Turn the tape recorder on!

GUIDE SHEET #4

THE STRUCTURAL INTERIOR OF A CONNECTICUT FOREST



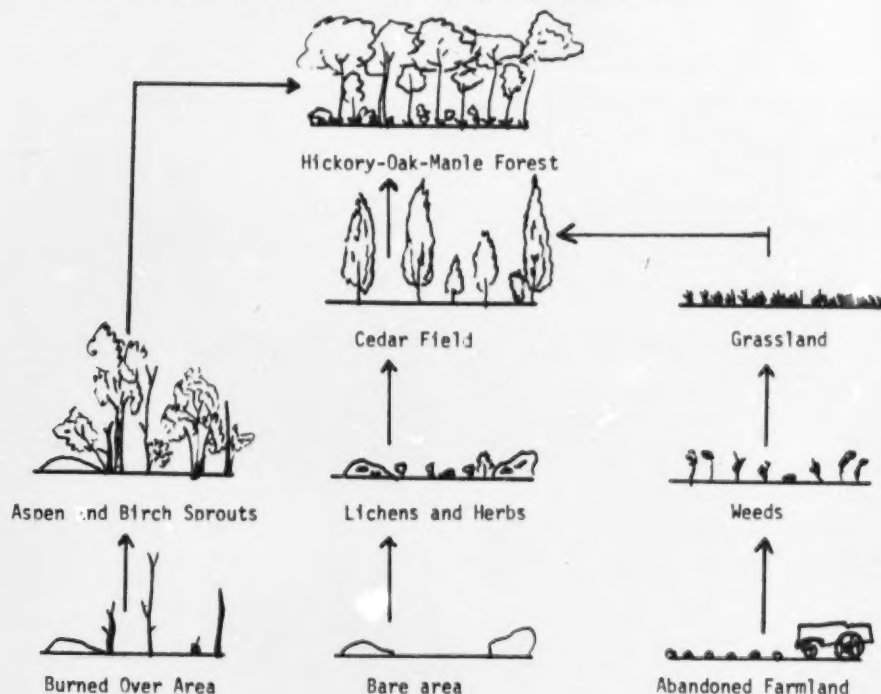
1. CAN YOU PICK OUT FOUR DISTINCT LAYERS OR STRATA?
2. WHAT GENERAL CONCLUSIONS CAN BE DRAWN ABOUT THE VARIETY OF PLANT AND ANIMAL LIFE OF THE FOREST? HOW DOES THE VARIETY RELATE TO THE STABILITY OF THE FOREST?

TURN BACK TO THE NARRIATIVE BUT KEEP THIS GUIDE SHEET HANDY

GUIDE SHEET #5

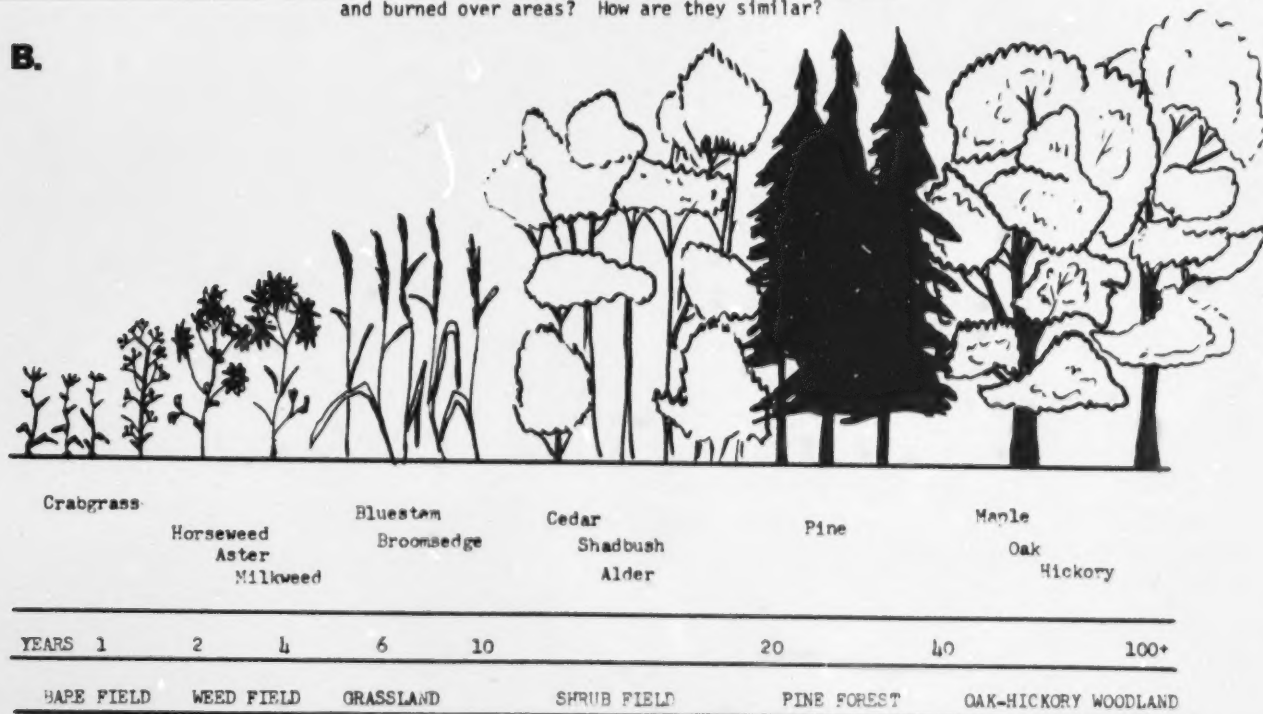
FLOW CHART OF FOREST SUCCESSION IN CONNECTICUT

A.



1. Do these stages of succession seem familiar? You may want to look around your community for examples of each.
2. What is the relationship between abandoned farmland, and burned over areas? How are they similar?

B.



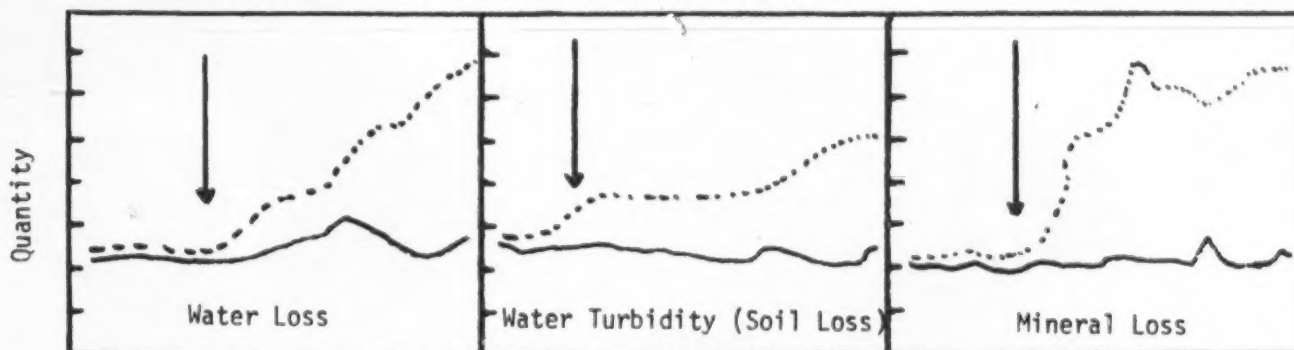
ECOLOGICAL SUCCESSION IN NEW ENGLAND

GUIDE SHEET #6

DATA FROM THE HUBBARD BROOK EXPERIMENTAL FOREST

- A.** A graphic presentation of results of a study of watershed dynamics of Hubbard Brook, New Hampshire. The values are depicted graphically, and represent trends, rather than actual values.

The dotted line represents the cut over watershed (Watershed 2). The continuous line represents the undisturbed watershed (Watershed 1).



*The arrows indicate the point in time at which Watershed 2 was cut over. That is, its forest cover was removed.

- B.** Partial results of the study of losses of minerals over a two year period on the Hubbard Brook watershed. Totals include several minerals deleted from this abbreviated table of results.

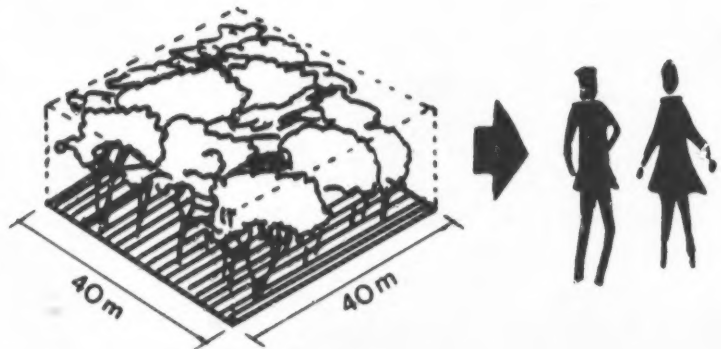
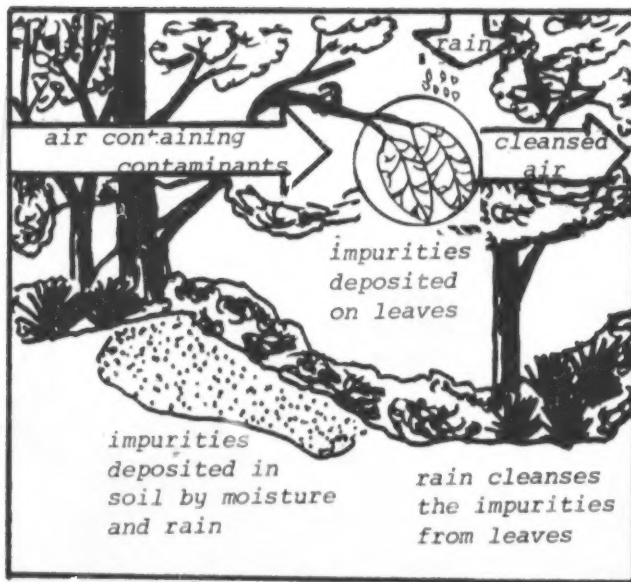
	1966-67		1967-68	
	Cut	Uncut	Cut	Uncut
Ca	-7.5	-0.8	-9.0	-0.9
K	-2.3	-0.1	-3.6	-0.2
Al	-1.7	-0.1	-2.4	-0.3
Mg	-1.6	-0.3	-1.8	-0.3
Na	-1.7	-0.6	-1.7	-0.7
NH ₄	+0.1	+0.2	+0.2	+0.3
NO ₃	-43.0	+1.5	-62.8	+1.1
SO ₄	-0.5	-0.8	0	-1.0
HCO ₃	-0.1	+0.2	0	-0.3
Cl	-0.1	+0.2	-0.4	0
SiO ₂ aq	-6.6	-3.6	-6.9	-3.6
Total	-65.0	-4.6	-88.4	-5.9

Table 4.2. Comparative net gains or losses of dissolved solids in runoff following clear cutting in the Hubbard Brook Experimental Forest for the period 1 June to 31 May. In metric tons/km²/year.

Source: Likens, Bormann, Johnson, Fisher, and Pierce, 1970.

When you are finished studying this guide sheet, return to the narrative. Turn the recorder on!

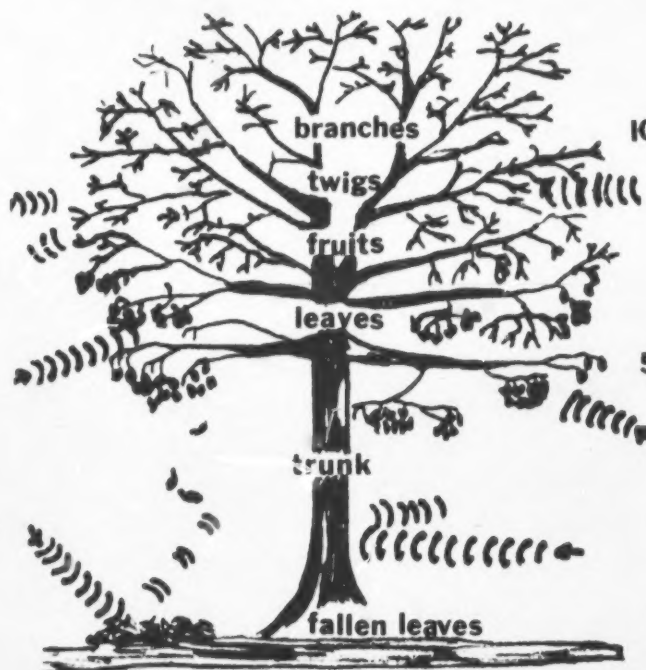
A. THE ROLE OF VEGETATION IN COMBATING AIR POLLUTION.



THE FILTRATION AND AIR WASHING FUNCTION OF TREES.

FORTY SQUARE METERS OF PLANTS SUPPLY THE OXYGEN REQUIREMENTS FOR ONE MAN

B. HOW VEGETATION HELPS ALLEVIATE NOISE POLLUTION.



PLANT PARTS THAT STOP SOUND



A ROADSIDE WOODS FUNCTIONS TO REDUCE NOISE LEVELS AS MUCH AS FIVEFOLD

GUIDE SHEET #8

FARM CROPS AND LIVESTOCK PRODUCED IN CONNECTICUT

On this guide sheet, there is a tabulation of the varieties of different kinds of crops or animals raised on Connecticut farms. For each of the six major categories you are to name specific plants or animals which are raised in Connecticut.

DAIRY PRODUCTS - At Least 6 Types

Name 4 1. _____
 2. _____
 3. _____
 4. _____

LIVESTOCK - At Least 6 Species

Name 4 1. _____
 2. _____
 3. _____
 4. _____

VEGETABLES - At Least 20 Kinds

Name 4 1. _____
 2. _____
 3. _____
 4. _____

POLTRY PRODUCTS - At Least 6 Kinds

Name 3 1. _____
 2. _____
 3. _____

FRUITS, NUTS, BERRIES - At Least 16 Kinds

Name 5 1. _____
 2. _____
 3. _____
 4. _____
 5. _____

NURSERY - At Least 20 Kinds

Name 3 1. _____
 2. _____
 3. _____

After you are finished naming the products of Connecticut's agriculture, turn the guide sheet over to check your list against a list we made in preparing the unit.

GUIDE SHEET #9

A PARTIAL LIST OF FARM PRODUCE GROWN AND MARKETING IN CONNECTICUT

Dairy Products

Milk
Butter and Butterfat
Cheese
Cream
Ice Cream

Miscellanea

Tobacco
Maple Syrup & Maple Sugar
Irish and Sweet Potatoes

Fruits

Blueberries
Cranberries
Currants
Gooseberries
Raspberries
Strawberries
Cherries
Apples
Peaches
Graps
Pears
Plums
Apricots

Livestock

Cattle and colves
Pigs and Hogs
Sheep and Lamb
Horses
Goats

Nursery

Perennial flowers (many varieties)
Annual flowers (many varieties)
Shrubs (many varieties)
Trees (many varieties)
Seeds
Ornamentals
House plants

Vegetables

Lima Beans
String Beans
Beets
Browssel Sprouts
Cabbage
Carrots
Cauliflower
Celery
Corn
Cucumbers
Eggplant
Lettuce
Onions
Peas
Spinach
Squash
Tomatoes
Turnips

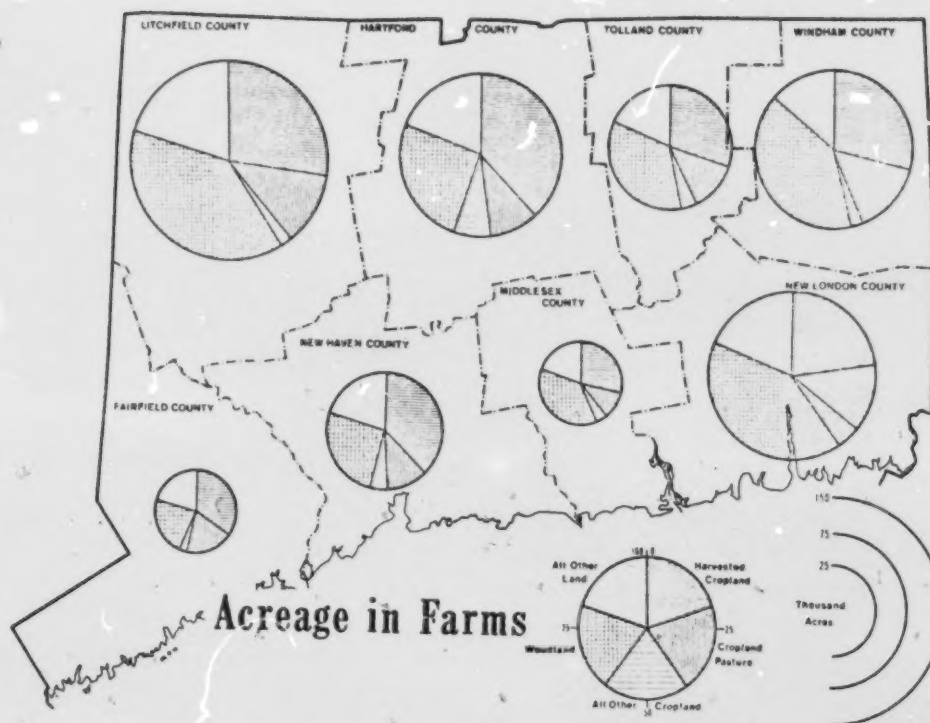
Poultry and Poultry Products

Chickens
Eggs
Turkeys
Ducks
Geese

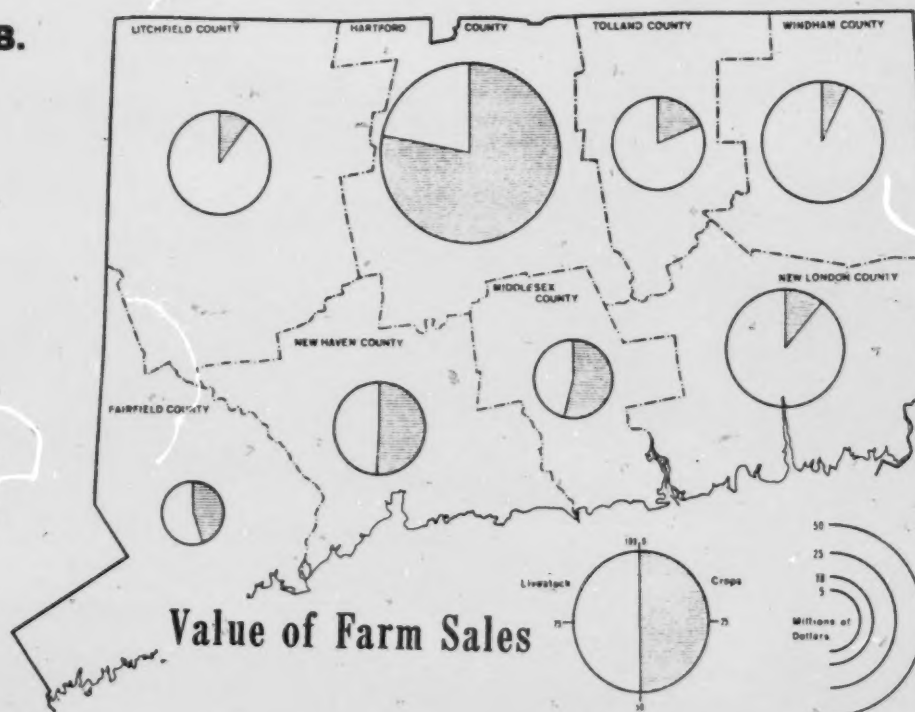
Grains

Hay
Alfalfa
Clover
Wheat
Sorghum
Oats

A.



B.



SOURCE: CONNECTICUT - A THEMATIC ATLAS BY ALLEN R. SMITH, PUBLISHED BY ATLAS, P.O. BOX 115, BERLIN, CT 06511, 1974. REPRINTED BY PERMISSION OF THE AUTHOR

GUIDE SHEET #11

A. CONNECTICUT'S PRODUCTION AS A PERCENT OF CONNECTICUT'S CONSUMPTION (1970)

<u>% state consumption produced within state</u>	<u>total production</u>
57% Milk	651 million lbs. milk 100 qts./person
35% Broilers	3.3 million broilers
29% Fresh Vegetables	4 million heads lettuce
90% Eggs	924 million eggs - 300 eggs/person/yr.
92% Poultry Meat	
100% Apples	25,200 tons 16 lbs. apples/person

Source: Agriculture and You - the Connecticut Citizen by W.A. Cowan, University of Connecticut.

	<u>New Jersey</u>	<u>Massachusetts</u>	<u>Connecticut</u>
1949 Farm Acreage (acres)	1,773,050	1,863,517	1,563,340
1971 Farm Acreage (acres)	1,000,000	710,000	580,000
loss farm land (acres) 1949-1971	733,050	1,153,517	983,340
% acreage loss 1949-1971	43.6%	61.9%	62.9%

Source: Impact of Agriculture on New Jersey Economy, November, 1972.

C. NUMBER OF FARMS IN SELECTED NEW ENGLAND STATES

<u>Year</u>	<u>Connecticut</u>	<u>Massachusetts</u>	<u>Vermont</u>
1968	5300	7000	8100
1969	4900	6500	7600
1970	4700	6300	7200
1971	4700	6100	7000
1972	4500	5900	6700
(1974 estimate)	4100	5600	6300

Source of Data in Part C and Part D: Connecticut Agriculture--Trends and Status, 1973.

D. NUMBER OF DAIRY FARMS REGISTERED FOR SALE OF MILK BY COUNTY

<u>Year</u>	<u>Windham</u>	<u>Litchfield</u>	<u>Connecticut</u>
1968	196	370	1,280
1970	185	314	1,127
1971	174	299	1,057
1972	164	281	1,009
1973	153	248	905
1974	149	231	863
% loss 1968-1974	-24%	-38%	-33%

When you have completed your study of this guide sheet, turn the recorder back on.

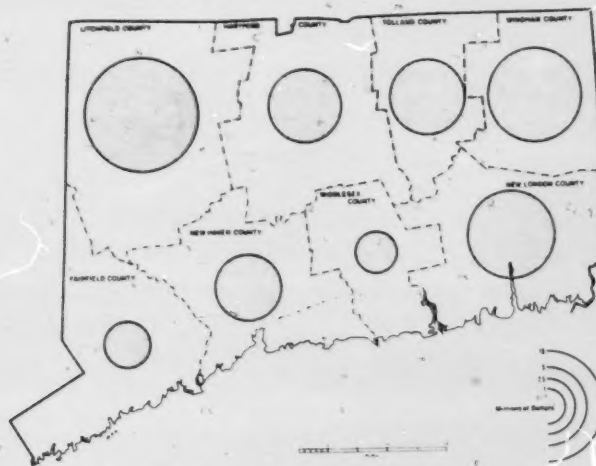
GUIDE SHEET #12

A.

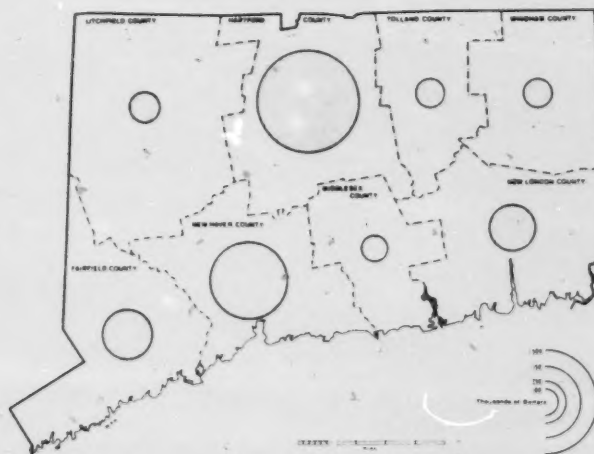
Livestock Sales



Dairy Products Sales



Vegetable Sales

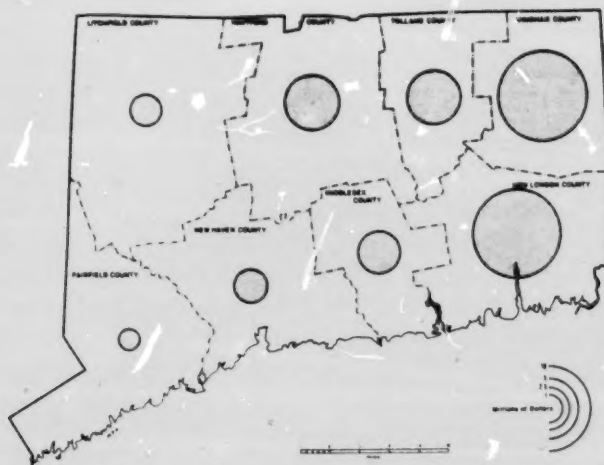


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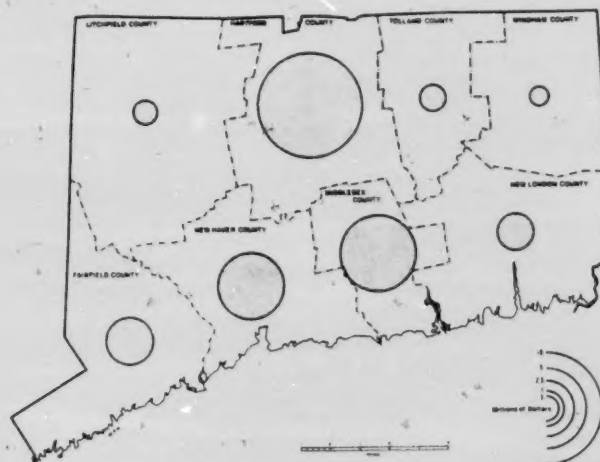
B.

GUIDE SHEET #12

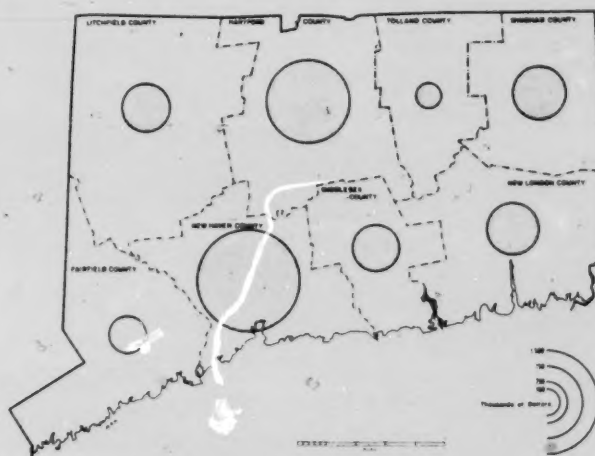
Poultry Products Sales



Nursery Products Sales



Fruit, Nut & Berry Sales



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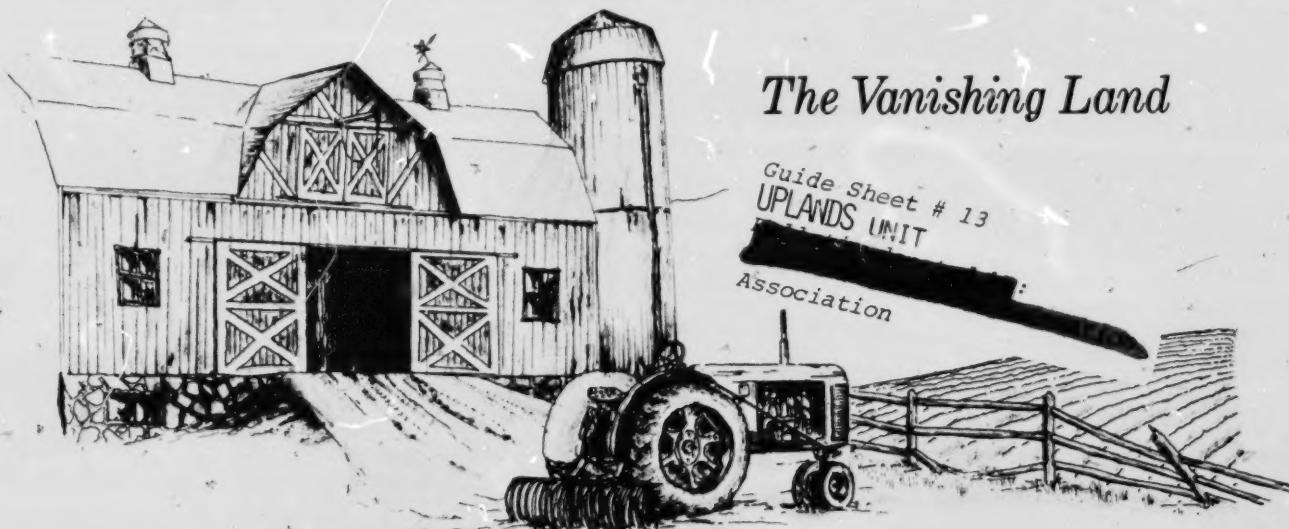
CONNECTICUT CONSERVATION ASSOCIATION

A CCA REPORTER WHITE PAPER

VOLUME 7, No. 2

BRIDGEWATER, CONN.—TELEPHONE 206/354-9325

August—September 1974



A friend and neighbor is in trouble in Connecticut and needs your help—he is a farmer.

Connecticut's agricultural industry is rapidly dwindling to obscurity. The pace has dramatically quickened in the last few years and unless checked soon

the state will lose one of its most prized citizens. Prized, because the farmer is the keeper of an endangered resource . . . open space, because he supplies food for a still-increasing population and because his activities are important to the State's economy.

If farming dies in Connecticut the state will change and, by-and-large, for the worse. And, at the present time very little is being done to prevent it.

The truth is that few people realize what agriculture means to the state. The facts are impressive.

AGRICULTURE IN CONNECTICUT

Open Space—Today, approximately 520,000 acres, or roughly one-sixth of the state's 3.1 million acres are classified as land used for agricultural purposes. Of that amount, one-fifth is tilled or in pasture; the remainder is in forest lots, brush, marshes, etc.

These acres plus the more than 100 state parks and state forests totaling another 200,000 acres are the Connecticut countryside.

Found throughout are highly prized fresh water wetlands, streams, brooks, ponds, forests and fields. The farmer is the keeper of these lands. He is the steward of the land. As long as he remains, these resources remain. When he is gone, all too often these irreplaceable natural entities

are buried under the wheels of development.

The esthetic value of farm land as open space is best experienced rather than described. A relaxed drive in the country on a summer day is all that is required to understand the esthetic value of agricultural open space.

It is estimated that by the year 2000 some 400,000 people will be using Connecticut's open space for recreation through sightseeing. Another 250,000 will be using fields and woodland for camping, picnicking and hiking. Six hundred-thousand people will be seeking facilities to swim, boat and fish.

Farms break up the expanse of woodland that once covered Connecticut. The patchwork of fields and meadows have added diversity to the landscape. This diversity, in turn, has encouraged a diver-

sity of wildlife, so prized for its esthetic, recreational, and ecological value.

Farm lands, especially those closest to urban areas tend to act as "free" pollution treatment systems. Some comments by C. R. Frink, Chief of the Department of Soil and Water, the Connecticut Agricultural Experiment Station are instructive: "The ability of agricultural land to absorb and utilize our wastes, can be expected to increase in importance as our population increases. One example of the need for agricultural land occurred when the city of Hartford was required to dispose of an accumulation of sewage sludge amounting to approximately 100,000 cubic yards. After exhausting other possibilities, they were delighted to truck it, a few yards at a time, to about 1000-acres of nursery land located on the nutrient-poor sandy soils of the Connecticut River Valley.

"As more sewage treatment plants are built, the disposal of their nutrient-laden effluent can be expected to add additional nitrogen and phosphorous to our lakes and streams, some already choked with weeds and algae. Tertiary treatment to remove these nutrients is expensive, but purification by filtration through a soil-crop filter removes nutrients cheaply, grows a useful crop, and recharges the ground water. The town of Litchfield is considering utilizing an adjacent farm to renovate their effluent, and other towns have expressed interest in similar schemes.

"Agricultural land traps air pollutants such as ozone and sulfur dioxide. For example, typical polluted air containing 150 parts per billion (ppb) ozone would be filtered by a forest of trees 15' tall so that air reaching the forest floor would contain only 36 ppb. Expressed differently, one acre of vegetation will trap the ozone from eight automobiles, or the carbon dioxide from fifty. Studies of the ability of vegetation to trap spores of various fungi show that vegetation is also a very effective filter for particulate matter. In the summer, the three or four acres of foliage covering an acre of ground remove large quantities of dust from the air.

"Agricultural open space also reduces noise pollution, which can be considered another unwanted by-product of our growing society."

Perhaps the most important nonfood producing service provided by agricultural and other open space in Connecticut is the maintenance of the hydrologic cycle which provides us with the water we require for home use, industry, and recreation.

The availability of fresh water tends to be a limiting factor on man's activities. When communities outgrow available local water supplies, water must be provided by newly created, expensive, land-consuming reservoirs, or piped from distant ground water sources. In highly developed areas competition for water becomes keen and solutions to provide all the customers with adequate supplies become grossly expensive and burdensome on regional environments.

Open lands, such as farms, help maintain local water supplies by absorbing precipitation and transferring it to the ground-water system, to brooks, ponds, and lakes.

In many sections of Connecticut nearly the entire watershed of the area is made up of agricultural acreage. Transferral of these acres to uses not compatible with open space values would adversely affect the entire hydrologic system, hence the water supply, for the communities in the region.

As pointed out earlier, water-based recreation is projected to be the most sought-after form of outdoor activity in Connecticut. Both the quantity and quality of the state's water resources will dictate how well the "supply" will meet the demands.



Food Production—The food production value of the agricultural industry is obvious and increases every few seconds as babies are born here and throughout the world.

On a national average, about 60 people depend on one farmer for their food. Connecticut consumers have a far greater ratio of dependence. For example, in Connecticut, approximately 400 residents depend on one dairy farmer for milk. While the state is far from self-sufficiency (and getting less so) Connecticut's farms produce a surprising 20 percent of its protein needs.

Nearly 40 percent of the milk consumed in Connecticut is produced here, as is approximately 35 percent of the broiler meat, 36 percent of the fresh vegetables, 90 percent of the eggs, 95 percent of the poultry meat, and 100 percent of the apples.

In terms of volume, in 1972 Connecticut's dairy farms produced 651 million pounds of milk, poultrymen produced 924 million eggs, and 3.3 million broilers. Nearly five billion ears of corn were grown in the state and nearly 4 million heads of lettuce, to cite just a few commodities.

The total food production value amounts to quite a mouthful.

Economic Contribution—Agriculture is big business for the state. The total cash farm income in 1972 for crops, livestock, and livestock products was \$163,855,000. Of that amount, the largest returns were: \$48.5 million in dairy products, \$39.9 million in egg sales; \$21.9 million in tobacco, and \$23.4 million in forest, greenhouse and nursery products.

Connecticut ranks second in New England in value of products sold by dairy farmers, second in egg production (18th in the Nation), second in corn production, third in apple production, first in peaches, and first in pears.

Connecticut had 13,000 head of beef cattle on January 1, 1971, or one head of beef cattle for every eight dairy cattle. There are many relatively small herds and interest is high. Connecticut has more beef cattle per square mile than any other New England state, and Vermont and Connecticut were the only two New England states to increase in beef cattle numbers from 1970 to 1971. There are many nationally known producers of breeding stock in the state and they have achieved prominence

in national competition.

Connecticut has the highest population density of horses in the Nation. The more than 35,000 horses represent the largest number of horses per state in New England.

According to Dr. W. A. Cowan, of the University of Connecticut, "Horse owners have an economic impact on the economy of Connecticut. Purchases and sales of horses, feed, bedding, equipment, barns, tack, apparel, veterinary and blacksmith services, and expenses incurred in transportation and participation in competition are difficult to estimate but with 35,000 plus horses, it has to be a multi-million dollar business. One million dollars a year would be an estimate of expenditures for feed and bedding alone. There are many regionally and nationally well-known breeders of several horse breeds in the state today. There will be more horses in the years ahead in Connecticut as well as more horse activity of all sorts." (Only, of course, if the space is saved!)

Dr. Irving Fellows of the University of Connecticut's Department of Agricultural Economics, estimates that in total the state's agricultural industry directly generates one-quarter of a billion dollars in economic activity each year. This includes the equivalent of 18,000 year-round jobs for Connecticut residents plus additional thousands of part-time jobs. For example, during shade tobacco harvesting as many as 22,000 people may be employed on a single day, of which some 8,000 come from the Hartford area.

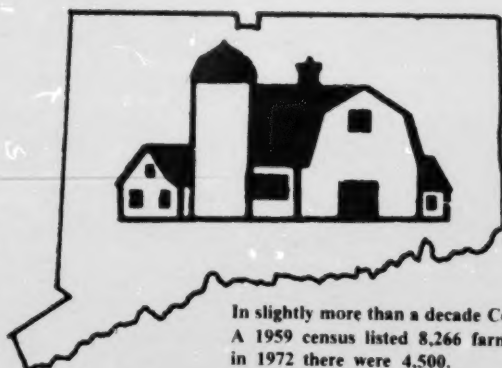
The indirect economic impact is difficult to measure because of the endless list of potential, indirect contributions. For example, the recreation industry in Connecticut is currently valued at nearly a half-billion dollars and provides for nearly 25,000 jobs. This figure could easily double or triple (or go down) in the next decade contingent on how future development affects the resource base—land. According to the State Development Commission, most tourists value Connecticut for its scenic qualities . . . the countryside.

What is the countryside but woodlots, farms and quaint villages? What, therefore, is the recreation-tourist dollar value of Connecticut farms? A difficult figure to calculate precisely, but one not too difficult to estimate.

While all of this is impressive by itself, an important point must be made which is often overlooked.

The demands for and recognition of the value and necessity of open space is growing. The demand is already acute for the most populated counties and, for some, already impossible to meet. The state's land acquisition program has slowed because of rising land costs and diminishing funds. Since the state is still loath, at this time, to consider broad zoning policies, few nonacquisition alternatives exist for preservation of open space.

1959



In slightly more than a decade Connecticut has lost half of its farms. A 1959 census listed 8,266 farms in operation, in 1972 there were 4,500.

1972



However, farm land is open space that does not cost the state. Rather, it is open space with both dollar returns and intangible benefits.

It makes money for the state while offering, free-of-charge, all those valuable services inherent in open space. That's quite a bargain!

While not all farmers open their land for public recreation, many do, and with proper incentives and management it is very likely that more would be willing to do so. For example, the legislature a few years ago passed a law limiting the liability of a farmer in cases of personal injury to an individual on his land. In the past if a bird-watcher stepped into a fence hole while stalking an owl, he could sue the farmer for damages. Not so anymore and this has encouraged many farmers to remove some "no trespass" signs.

The possibilities are limitless as is the true value of the state's agricultural industry. But all are slipping through our fingers. As pleasant a picture as it might be, the truth is that the industry—and all that it is worth to us—is dying.

THE PROBLEM

Agriculture has come a long way since the family horse and plow. It is a business. To be successful, a farmer has to be a businessman as well as a planter, husbander, and harvester. In the old days a farmer could survive on hard work and some luck with the weather. To survive in 1974 a farmer has to work hard, have some luck with the weather, and be part market analyst, economist, lawyer, chemist, mechanic, salesman, accountant, and public relations expert.

The fact that the farmer in Connecticut is in big trouble is *not* attributable to a lack of ability. Despite relatively poor physical land characteristics and generally (of late) unfavorable luck with the weather, Connecticut farmers have managed to continually increase per-farm productivity.

Rather, the problems of Connecticut farmers are caused by external social and economic factors over which individual

farmers have little control. If the farmers can be faulted it is for not working *collectively* hard enough to protect their own interests. Perhaps it is the nature of the men and women who farm to remain as self-reliant and independent as possible.

Likewise, the public and private agencies representing agricultural interests have not, unfortunately, to date, been able to stimulate the necessary awareness and concern over the plight of the state's agricultural industry among the general public and its governing representatives.

Perhaps it is due in part to changes in the state's decision-making bodies. Where once the Connecticut General Assembly was dominated by farm interests, there were, in the Spring 1974 General Assembly, only four members who listed farming as an occupation. In the same 1974 session, there were 22 legislators who listed real estate or construction as all or part of their professional occupations; and a large number of others who likely value farm land for different reasons than farmers.

Correspondingly, the bureaucratic spotlight has, for the past several years, shifted toward urban problems, development problems, pollution control, and other aspects of environmental management. In a sense, this has diverted some attention from the farmer and, in the case of some programs, added to his problems.

The sum of these circumstances is a gap between the problems facing the state's agricultural industry and public recognition of the problems which hopefully could lead to corrective solutions.

A full and clear recognition of agriculture's plight has not yet come to the citizens and legislators of Connecticut, but hopefully it's on the way.

Citizens and governmental agencies are gradually shifting attention toward broad scale land planning and land management and as this occurs, the farmer and his land are coming into sharper focus.

At the same time, but unfortunately, recognition is coming from front page headlines telling of disaster and the fact that for many farmers it is already too late.

Headlines such as "Connecticut Dairy Farms Dwindle to 900" (Waterbury Republican); "Another Local Farm Gives Up the Struggle" (New Milford Times); and scores of others carrying the same message—Connecticut is losing its agricultural industry.

In slightly more than a decade Connecticut has lost half of its farms. A 1959 census listed 8,266 farms in operation, in 1972 there were 4,500.

The number of dairy farms, for example, has dropped from 7,686 in 1935 to around 900 today and a 10 percent loss is predicted for this year. Amazingly and fortunately, these farms are producing nine times as much milk per farm as those in 1935. However, where once increased size of the farms compensated (from a production standpoint) for a decreasing number of farms, this is no longer true and milk production in Connecticut has been dropping over the last two to three years. While some farms have gotten larger, the number of producing acres overall has shrunk dramatically. For example, one of every four acres farmed in 1964 was no longer being farmed five years later. Currently there are approximately 520,000 acres or one-sixth of the state's total land area, left in agricultural ownership. But, the actual farm acreage is dropping rapidly each year. In the past, as farms went out of production, many were absorbed by other farms. Thus, while the *number* of farms declined, the actual *acreage* of farm land was not declining at a corresponding rate. This is no longer true today. The trend now is when a farm goes out of business the land goes out of production. Much of that which goes out of production goes under concrete. Between 1960–1970, residential land in Connecticut increased by 54 percent, commercial land by 86 percent, industrial land by 68 percent and land used for institutional purposes by 89 percent. Recall that during the same period the number of farms decreased by approximately 50 percent. This is reflective of the fact that agriculture has been the forgotten industry. Food is taken for granted, while at the same time *growth* has not only

been taken for granted but blindly fostered as the ethic of the times. Municipal governments work eagerly to attract new commerce and approve new subdivisions, while citizens protest higher food prices—few think far enough to connect the two.

Everyone wants to have their cake and eat it too—except there will soon be a cake shortage.

There are several key reasons why farms are disappearing in Connecticut:

LAND VALUE—The most obvious, and perhaps most important, is the rapid rise in the dollar value of land. Competition for land is intense. Demand is high, the supply of land is limited. Market values for some land in Connecticut have risen as high as 100 percent in a two to three year period. The average for New England farmland shows a 100 percent rise in value since 1967. As a region, New England has the second highest land values in the Nation. In northern New England the phenomenal increase in second or recreational home building is a key cause. In southern New England, increased housing needs and open space needs have been the principal stimulus. This brings tremendous pressure on farms, particularly those in "hot" growth areas of the state and those nearest to suburban or urban centers. This pressure becomes acute when the farmer sees his land placed on the "zoned for residential" or "zoned for commercial" development list. One farmer, who had just put up a for sale sign, told CCA that the last straw came when his local assessor and other town officials let it be known to him that they were "anxiously awaiting" the day when his farm land could be turned over to a developer. "When fellow townsmen and neighbors don't want farming in the community, it's time to get out," he stated.

Rising land values coupled with an inflationary economy can tend to result in higher taxes. The farmer, of necessity, owns a proportionately large amount of land. If Connecticut farmers were taxed on the market value of their property there would be but a handful left. Fortunately, Public Act 490, passed in 1963, allows most farmers, and certain other owners of open space, to apply for a use-assessment which can mean a significant reduction in land tax. There is little question that P.A. 490 for many farmers, is the difference between staying in business and not. However, the land tax burden, even at reduced levels, continues to grow. The simple fact that thousands of farms have gone under since 1963 serves to illustrate that for all P.A. 490 is worth—it is not enough.

A big tax bite comes on farm buildings. Many local assessors make up some of the "difference" in reduced land tax revenue by rapping the farmer with heavy assessments on buildings, equipment and, occasionally, on certain farm animals. A local administration blindly bent on converting farmland into shopping centers or



subdivisions can really put the squeeze on via taxes, even with a P.A. 490 in the farmer's corner.

FARM PROFITS—How ya go'na keep 'em down on the farm if they can't earn a living? It's getting tougher to make a buck in the farming business, at least in a state like Connecticut.

Between 1968 and 1972 gross farm income in Connecticut rose by \$6.5 million while net farm income dropped by \$12.2 million. The lion's share of the difference is in rising operational costs and relatively stable, federally regulated end-product prices to food consumers. The profit gap between costs and returns is constantly narrowing.

To illustrate how and why this is happening, one need only look to the state's dairy industry. Nearly all Connecticut dairymen rely on imported feed to fill the bulk of their needs. Ninety-eight percent of the "concentrates"—grains and protein supplements is imported, as is a small amount of the "roughage." Most farms simply cannot grow enough roughage and economically cannot compete with "concentrates" growers in the Mid-west.

Feed prices have been less regulated than milk prices and have consistently been allowed to reach market clearing levels. In 1973, for example, feed prices jumped by 75 percent. Transportation costs have risen sharply across the board but farmers in the Northeast have suffered unusually in this regard. The South has for years enjoyed lower rail transport charges under controversial ICC regulations. Simply stated, due to lower transportation costs, farmers in the South pay less than farmers in the Northeast for the same feed commodities.

The disappearance of dairy farms in Connecticut has now begun to compound problems for those remaining since wholesale, lot-buying opportunities have been diminished. Also the disappearance of farms has caused many service industries, such as feed dealers, to close shop. This reduced competitive atmosphere among grain suppliers may be having an effect on feed prices.

In addition to feed price inflation are increased labor costs (when labor can be found), purchase and maintenance of farm equipment, taxes, insurance, etc. The list has no end. On an average, for every dollar of farm income, nearly 85 cents is spent for production materials. The dairymen's cost, for example, is up 15-20 percent over 1972 levels while his share of the consumer dollar is up only one percent. During the past decade the farmer has averaged only a 3.9 percent return on the equity of his capital investment. The average income of farm families does not reflect the higher productivity of the farmer. It is still only 54 percent of the income of the non-farm family.

What it amounts to is that to be profitable a dairy farm has to have volume. Time was that a herd of fifty milking cows could give a dairyman a reasonable living. Today, a minimum herd of 80-100 is needed to give an average farm family a modest income (around \$10,000). However, a herd of this size requires an additional employee to manage properly. For those farms with fewer cows (or larger than average families) outside income is necessary. This means a part-time job for the farmer and/or the same for his wife. For many, at some point in the balancing of what one has and what one needs, comes the conclusion that

farming is not satisfactorily meeting the needs. Waiting in the wings, never very far away, is someone eyeing the land and willing to pay a premium price for it. Scratch another dairy farm.

FARM LABOR—Another serious problem for the state's agricultural industry is the availability (never mind the cost) of labor; especially seasonal labor needed during harvesting season. Young people can make more money pumping gas or car-hopping at a local drive-in restaurant than they can driving a tractor or picking tomatoes. Many farmers offer the opinion that today's youth aren't as "hardy" as yesterday's and find the prospect of long, hard work days at comparatively low pay most unattractive.

At any rate, farm labor is a serious problem. One Newtown farmer (about to go out of business) reported that while he would prefer to continue farming for at least another five years, he would have to hire a full-time hand to do so. The cost of housing an additional employee plus his salary would have taken more than half of the farmer's net income. The farmer could not make ends meet for his family under those circumstances. Scratch another farm.

NEW FARMERS—This can be turned around to say that it's difficult to find job opportunities in farming. Certainly this is true for young people interested in making a start in the business. It is estimated that a young person today needs about \$125,000 (some put the figure as high as \$250,000), as an initial capital investment to get a firm start in farming. That is, to acquire the land, be in a position to accomplish moderate building renovation, replace equipment, etc. In the dairy business it may also mean the acquisition of a herd. It is difficult, if not impossible, to gradually accumulate a profit producing herd while maintaining a newly acquired farm. The farmer must have the herd immediately, he must have a full running start. If he does not, he will go into debt rapidly.

Some young prospective farmers are able to work out a deal where they gradually build up a dairy herd using someone else's pasture and facilities. This allows them to be prepared for the running start. He still, however, needs the big capital for the farm purchase. There are some government loan programs to help, but it is generally felt that more assistance is needed if young people are to be successfully encouraged to go into farming. The fact that few young people are going into farming is reflected in the fact that the average age for farmers in Connecticut is 58, as opposed to 56 years old a few years ago.

INHERITANCE TAX—Farmers with children interested in continuing the business must plan carefully to avoid crippling federal and state inheritance taxes. In the absence of careful planning many "sur-



vivors" have been forced to sell to pay the taxes. The federal inheritance tax is usually brutal and the state then assesses a tax representing 30 percent of the federal tax. It takes a lot of ready cash to handle the total.

NEW RULES AND REGULATIONS—

To a degree, life has been made tougher for some farmers by the wave of public concern over environmental degradation. Under critical eye in many locations are some fertilization practices which add serious nitrogen loads to nearby bodies of water thus increasing eutrophication problems. Stream siltation from cultivation activities is another problem farmers are having to deal with. Likewise, disposal of animal wastes is getting tougher.

NEW NEIGHBORS—As the fingers of suburbia reach out into the countryside and encroach upon farmland, the farmer is faced with new neighbors that often do not understand farming. The new residents suddenly feel that their "rights" are impinged upon when they encounter a slow moving tractor on the road, or when the odor of freshly spread manure settles over their backyard, or when the sound of a harvester interferes with a Saturday afternoon nap. Many of these same "indignant" people will insist, however, they be allowed to blast over the farmer's fields on noisy snowmobiles or touch off shotguns in the farmer's backyard.

If the disagreements remained verbal it would be one thing, but often the new suburbanites are found proposing and voting for new local ordinances that interfere with necessary farming activities.

Such is the plight of the Connecticut farmer. At the moment, there is little relief in sight. Yet, there are many who want to farm and will until the pressures become simply too great.

For the good and benefit of the state of Connecticut and its citizens, these farmers must be allowed to stay in business. To do

so, the state and its environmental organizations will have to reach deep into their pool of intellectual leadership because the problems are complex and some are beyond the capacity of one state to solve. It will also, eventually, have to reach into its wallet because many of the practical solutions will require state and/or local monies.

There are, however, solutions.

SOME ALTERNATIVES

As previously mentioned, the only statewide program in Connecticut of any consequence designed to help farmers stay in business is Public Act #490, known as the Open Spaces Act. It has helped but is not enough to shore-up a collapsing industry... it simply is not capable of doing so. While its purpose is to "provide for the welfare and happiness of the inhabitants of the state," it ultimately depends on the independent and largely uncoordinated judgements of the various local assessors and town commissioners. To date, there is no statewide inventory of the total participants, nor are there any total acreage figures, or assessment of reductions in participating property taxes. It is an enabling act; the actual administration and record keeping remain with local government and often in the hands of poorly trained people. It is strictly voluntary and takes into account only one of the several problems facing the agricultural industry. More is clearly needed as the record obviously documents.

A Brief History—As early as 1719 land speculation was known, as evidenced by conditions of purchase in the sale of Litchfield Township lands. Speculation was discouraged by requiring purchasers to build a "habitable house" within three years, live in the house for at least three years, and for five years thereafter not to sell or lease the house.

In more modern times, Connecticut has been among those states in the forefront providing differential assessment for open spaces land. Though Maryland in 1956 was the first state to adopt an agricultural open spaces law, the Connecticut legislature in 1955 established a bipartisan commission to study the retention of farming in the state. The commission's report included a recommendation to provide property tax relief to farmers. A subsequent bill did pass the legislature, but was vetoed because farm organization proponents of the bill had lobbied in such a manner that the legislation became enmeshed in partisan politics.

However, in 1962 the dominantly Republican farm interest groups joined with a Democratic administration in assuring the passage and signing of Public Act #490. In doing so, Connecticut became the fourth state to adopt open spaces legislation. (Copies of P.A. 490 are available from the Connecticut Conservation Association.)

The act furnished general guidelines to assessors but avoided detailed, technical specifications or formulae so that local judgement could be exercised.

Many people felt that such legislation must contain a "tax recapture clause" or other provision to restrain landholders from abusing the law by enjoying reduced taxes until such time as they chose without penalty to convert land use. The recapture clause was cut from the final version of the 1963 bill. Other states' reports on open spaces legislation in subsequent years noted this glaring deficiency in the 1963 Connecticut statute. It was not until 1972 that the General Assembly responded. The conveyance tax bill as passed by the 1972 legislature established that a tax would be applicable to the total sales price ranging downward from 10 percent of the sales price if the land were sold during the first year of acquisition or classification (whichever is earlier), declining one percentile point each subsequent year until no conveyance tax is imposed following the tenth year of ownership.

The language of the Open Spaces Act is constructed so that the statute would not be found unconstitutional on the grounds that it provided special tax relief to a unique class of taxpayers. The focus is on land use; the criteria for the classification of land as farm land for taxation purposes allows the income from the land itself, not the owner's income from other sources, to be considered. Yet, as a land use control statute the Connecticut Open Spaces Act provides for virtually no control over the ultimate fate of the land, even with the 1972 conveyance tax amendment. Any holder of farm land or forest land, individual or corporation, local or absentee, may apply to the local assessor for preferential tax treatment under the Open Spaces Act. A real estate development corporation legally may request the lower use value assessments on farm land holdings; the approval rests with the local assessor. A 1969 Land Use Value Review Committee report noted that forest land would qualify for continued preferential tax treatment even if the owner had filed an approved development plan with the town. Prior to the conveyance tax amendment, property holders suffered no penalties in developing the enrolled land when they decided the market was right for financial gain. The conveyance tax mitigates a glaring abuse, a literal tax windfall for speculators. *But the erroneous notion that the Open Spaces Act is a permanent land control device remains.*

There is no contract between the property holder and the town, or any other governmental jurisdiction, that would preclude development of the open spaces land at a time of the owner's choosing. If the land has enjoyed preferential property tax treatment for five years, for example, the speculator now must include five-year, five per-



cent conveyance tax as another deductible transaction cost in calculating net returns from development. But the rate of annual appreciation, the value of land as an element in the total development project, capital gains taxation, and other considerations can swamp the conveyance penalty in the decision to develop. Twenty other states now have open spaces legislation which can be grouped into different categories according to the specific protections provided state residents at large. One group of laws simply provides annual property tax relief to farmers and farm land owners, regardless of glowing intents in the respective preambles to such legislation. These state statutes have no restrictions or constraints on land development at the owner's will. New Hampshire, in March 1972 a recent state to adopt open spaces legislation, falls into this tax windfall category.

Other states take seriously broad land use control in state...not simply town...development. No state has claimed success with preferential farm land assessment as a panacea for urban sprawl and unbalanced development patterns. California has been recognized as adopting the most sophisticated open spaces legislation in 1965.

California, Pennsylvania, and select other states comprise a so-called "contract" category of states with open spaces legislation. These contract states differ from each other and from Connecticut in regard to size, population densities, political temperament, agricultural importance, and other considerations. Yet these contract states share a common perspective, or attitude regarding the role of preferential land tax programs in overall state development that contrasts with provisions of Connecticut Public Act #490.

The California approach brings the state into the program as an active partner. Importantly, California recognizes that the entire state benefits from agricultural open space and thus assists local governments financially with payments of \$1.00 per acre for coverage of administrative costs of the program.

Participating communities designate "agricultural preserves" within their jurisdiction which then become eligible for differential tax treatment. Importantly, however, the lands receiving lower property tax, as a benefit of the program, must complement a town or regional "master plan" for land use and development.

Property holders with eligible lands within a designated preserve may voluntarily contract with a local government agency, surrendering development rights in exchange for a use value assessment. (For a more detailed explanation of California's Open Space Act, see Appendix A.)

The California law sets at least one precedent which seems to have caught on in other states. That is, agricultural districting. This approach has shown up in approved (or currently being considered) programs in Maryland, Michigan, New Jersey, and New York.

New York's program, now nearly three years old, offers some protection to approximately one-and-a-half million acres of prime agricultural land in 119 districts. Impressive as it is, it represents but 10 percent of the total farm land in the state and only 20 percent of what is considered the "best" farm land.

The intent of the New York program, according to the N.Y. State Department of Environmental Conservation, is to "curb wide speculation in rural areas which can lead to haphazard development, expensive public services and false expectations of

windfall gains in the land market.

"At the same time the New York law recognizes that much of the state's farmland is an irreplaceable resource which should be protected and enhanced both for its ecological significance and because of its contribution to the state's economy.

"The law prevents local governments from restricting farming practices . . . such as spreading manure . . . beyond the requirements of health and safety. Public agencies that want to acquire land in an agricultural district must demonstrate that acceptable substitute sites are not available.

"The law permits restricting public agencies in advancing money for non-farm developments such as sewers or water supply within the district and can restrict the power of public service districts to tax farmland for services that are not needed by farmers.

"Qualifying commercial farmers can also request annual property tax assessments based on the agricultural value of their land rather than on its full development value.

"Agricultural districts are initiated by farmers themselves. They agree that they would like to form a district of 500 or more contiguous acres and complete an application form which is submitted to their county legislative body.

"After review by the county government, at least one public hearing, and certification at both the state and county level, the district can be officially protected.

"It remains in effect for eight years, after which it is reviewed to determine if it still meets requirements for an agricultural district."

The state of New Jersey published, in April, 1973, a "Report Of The Blueprint Commission On The Future Of New Jersey Agriculture." In it, are several innovative and excellent recommendations. Importantly, it recognizes and deals with the inevitability of cost of any significant program.

At the philosophical heart of the plan is the idea that, "Agriculture in New Jersey is operating under the influence of an impermanence syndrome which leads to short-term decision making, less investment in agricultural enterprises, and slower technological adaptation. This can be corrected by creating a permanent land preserve for agricultural production and by making it feasible for farmers to farm this land and make a profit."

Like California, and New York, the districting concept is the heart of the New Jersey approach. Although in this instance each municipality in the state would be required to designate an Agricultural Open Space Preserve within its boundaries composed of at least 70 percent of its prime farmland.

Development rights for this property



would be sold to the state but the time of sale would remain the option of the landowner. Since the rate of compensation for the development easements would be the difference between the market value for the land and its farm value, some land owners might choose to wait to sell their easement.

The program will be financed by a 4 10 of one-percent tax on all real estate transfers in the state. (For a more detailed discussion of the New Jersey Blueprint Plan see Appendix B.)

These three programs . . . California, New York and New Jersey . . . provide instructive guidelines for what might be done in Connecticut.

Connecticut, of course, has traditionally been a strong home-rule state and any plan will likely have to accept this political circumstance if it is to wend its way successfully through the legislative process. However, it is evident that the state will have to be an "active legal partner" in a program if it is to be productive in retaining a viable agricultural industry and agricultural open space.

The Connecticut Conservation Association makes the following suggestions towards that end:

The goals of the program must be to provide for the long-term preservation of an agricultural industry of a size which guarantees a continuing and substantial economic and food production benefit to the state and of a kind that provides for a substantial percentage of the state's open space needs. The program must assure that no community is restricted from providing essential services because of reductions in local tax revenues.

Determining the state's long-range open space needs will be a difficult and time consuming task and in the interim, if the trend continues, thousands of agricultural acres will be lost thus reducing options and

opportunities in the final open space determinations. Furthermore, the establishment of an over-all state land-use plan with the muscle necessary to deal in real rather than abstract terms will be an agonizing political exercise for a state such as Connecticut. It is very possible that if the fate of agriculture is left entirely to a future land-use plan that it will be too late to deal adequately with the problem. For example, the recent "Proposed Plan of Conservation and Development for Connecticut" and the "Statewide Comprehensive Outdoor Recreation Plan," two efforts to deal with broad land-use policy, both recognize and mention agriculture but neither offers any hard guidelines for maintenance of the industry. The state must move with determination to establish an agricultural preservation program now before the industry and its open space are irreversibly decimated. And, there is logic for such a separate approach due to the enormous significance of this single land category.

A likely first step in any program will be the ordering of a comprehensive evaluation of the status of the state's agricultural lands with particular attention paid to the relative "security" of the farm units. No such information is currently available.

Decisions will likely have to be made on the ordering, or classifying of lands for priority action.

Of immediate concern should be those lands of highest agricultural value (productive capacity) and highest open space value (in relation to hydrologic cycle, pollution absorption capacity, scenic and recreational potential, etc.) which are immediately and seriously threatened by development activity.

The zoning, or districting of high value agriculture lands with municipal and/or state purchase of development rights appears to be one of the better alternatives. The New Jersey approach of requiring each

municipality to designate a percentage of its "prime" agricultural land for inclusion in an agricultural preserve is a method by which municipal governments can fully participate in and contribute to the classification process. New Jersey uses a figure of 70 percent of prime agricultural land within a municipality. Another approach is to establish a minimum percentage level, thus providing an opportunity for full inclusion in those communities which might be so disposed. For example, a highly developed suburban community with but a few remaining farms might choose to include all of the farm open space in an agricultural preserve, as opposed to being restricted to a fixed percentage.

Whichever alternative is chosen, the goal must be the assurance of a *permanent* agricultural preserve.

Funding for the program might best be found via the New Jersey approach. That is, by the issuance of a state bond for initial funding to start the program and a subsequent tax on all real estate transfers to allow continuing fiscal support. If the New Jersey figures are at all comparable it would mean something in the neighborhood of a 4 mill tax. In dollar language it would mean that if the transfer price of a house is \$40,000, for example, the tax would amount to \$160 which the seller would presumably pay out of the capital gains realized from the property sale. In this manner, monies would be made available on a continuous basis as opposed to the necessity of returning periodically to the legislature with budget requests. It also lessens the chance that budgeting would vary as administrations change.

Differential tax assessment provided for by P.A. 490 should be continued except that a standardized formula should be applied by the state government.

A system of some reimbursement by the state to local governments to reduce the impact of lowered tax revenues is a likely must for the program. The actual need for reimbursement would have to be carefully considered since many communities are currently choosing to allow maximum tax allowances to farms in spite of revenue needs. This is done, most likely, because some enlightened local governments are aware of the many benefits found in local agricultural enterprises.

In addition to, or apart from, such a program are other opportunities to aid agriculture such as:

Subsidized recreational activities—Many states and, to a limited degree, the federal government are providing cash subsidies to farmers who allow certain kinds of public use of their land. Hunting, fishing, hiking, camping, tours, horseback riding, and picnicking are some of the common subsidized activities.

Marketing assistance—Some states are proposing use of state-owned lands in prime locations as marketing areas for farm

produce. For example, cooperative market locations for fresh vegetables along state-owned roads or parks. Such an approach might be helpful in stimulating sales and consequently, continued or increased production.

Management assistance—The state, via contract with the University of Connecticut or other appropriate institutions should offer workshops for farmers on such matters as personnel management, market analysis, production techniques, etc.

Labor assistance—The state, in cooperation with state and federal employment programs, should upgrade and increase training and placement programs for farm labor. The state also should participate in advertising and otherwise encourage the jobless to find a position in agriculture. If necessary, the state should consider wage subsidies to make farm work more competitive. These monies might well be made up in reduced unemployment payments, especially considering current predictions for a rise in unemployment.

Loan assistance—Although the federal government provides some help in this regard there is general agreement that more is needed. The state, for example, could establish a low-interest revolving loan fund to assist farmers in land acquisition, equipment replacement, animal purchase, and other activities which increase farm productivity, and/or help new farmers get started. Similar, but perhaps less liberal loan arrangements could be made for farm home improvement and other, less directly related to productivity, needs.

Tax Relief—In addition to P.A. 490-kinds of benefits there should be additional tax relief on farm building construction, equipment, and importantly, a substantial reduction of inheritance tax at both state and federal levels for farms that will remain in active agriculture following estate transfer of ownership.

Insurance—Likewise, reductions in insurance costs for coverage on farm equip-

ment, buildings, animals, and labor should be negotiated by the state with private insurance agencies or provided by the state.

Education—Additional incentives in the form of grants-in-aid or educational loans should be made available to prospective students interested in pursuing a career in agriculture.

THE SEED MUST BE PLANTED

As pointed out, there is much that can be done to maintain our farms and the immensely valuable open space resource represented in the agricultural lands. There are approximately 520,000 acres remaining in agricultural ownership . . . about one-sixth of the state's total land area. This figure is shrinking and will continue to decline until something is done. The annual rate of loss is dramatic, thus prompt and decisive action is called for.

This must be a husbanding year for agricultural preservation programs for unless a bumper crop of solutions is harvested soon the opportunity to act will have gone by . . . our agricultural industry will be decimated. This year, alone, as we ponder, another 10-15 percent of the state's farms will go out of production. Thousands of acres will be lost; many, within the year, will be buried under concrete. The quality and character of Connecticut will decline . . . the same will happen the next year, and the next . . . UNLESS WE ACT.

The time to act will never be better, it will only worsen as the resource declines.

Developing the best kind of program is indeed a challenge and will require a determined effort. Other states have met and are meeting this challenge. It would be a grave oversight for Connecticut not to rise to the task.

YOU can and must help.

Individuals and agencies who are interested in your opinions and concern are:





1959 - 8,266 FARMS



1972 - 4,500 FARMS

Thomas J. Meskill, Governor,
State of Connecticut
Fenton P. Futtner, Commissioner,
Department of Agriculture
Douglas M. Costle, Commissioner,
Department of Environmental Protection
Governor's Task Force for the Preservation of
Farm Lands

Chairman: Atty. Charles Stroh
Exec. Sec. Donald A. Tuttle
Fenton P. Futtner
David N. Stiles
Dan W. Lufkin
Douglas M. Costle
Richard M. Stewart
Adolf G. Carlson
Arthur L. Woods
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Frank Prelli
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Your own Senate and House Representatives
to the Connecticut General Assembly.
Finally, the Connecticut Conservation Association
would very much appreciate hearing from
you on this matter.

CCA wishes to acknowledge that much
of the evaluative material on P.A. 490
was gained from an article, "The Initial
Decade of P.A. 490," written by Robert
N. Schoeplein, former faculty member
at the University of Connecticut. His
article appeared in the winter, 1972 issue
of Connecticut Government.

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both of the University of Connecticut.

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Douglas M. Costle
Frank E. Egler
Fenton P. Futtner
Dan W. Lufkin
William A. Niering
John F. Nye, Jr.
George D. Pratt, Jr.
George Russell

APPENDIX A

California Open Spaces (Williamson) Act of 1965

1) The state as an active partner. It was recognized at the outset in California that state financing in some element of the program was requisite to qualify the state as a party to a non-agricultural development contract with the property owner. The state agreed to a base payment of \$1.00 per acre to local governments for coverage of administrative costs of the program. The state of California further agreed to compensate cities, counties, and school districts for some identifiable portion of local revenues lost under preferential open spaces taxation. The specific reimbursement formula in this instance is complex and controversial, adjusting state contributions to the overall local property tax bases and to local tax efforts. The state in using general fund disbursements nonetheless acknowledges that an element of costs as well as benefits accrues to residents outside a particular town.

2) The designation of agricultural preserves. Local governments in California must specify particular belts or areas of land as "agricultural preserves" as one condition of the program. This requirement integrates differential farmland assessments with overall planning programs, reinforcing orderly land development. The initiative still rests with local governments that may be liberal or stringent in designating such preserve areas. The basic principle, however, is that lands receiving differential (lower) property tax treatment under open spaces must complement some long-range town or region development plan.

3) The nonagricultural development contract. This is perhaps the heart of the legislation in California and several other states. Property holders with eligible lands in open space preserves may voluntarily contract with a local governmental agency, surrendering nonagricultural development rights in exchange for use value assessments. The local government acquires these rights in the nature of a trustee. The contract also combines other protective features for the property holder such as some protection from government exercises of "eminent domain" powers during the protected period. A predictable adverse consequence of such an enforceable contract is that land speculators in the midst of rapidly developing suburbs have chosen to remain outside the program. This merely underscores the apparent dilemma that several simultaneous direct measures, not indirect tax incentives, must be employed to control land and environment use in the most volatile urban growth areas. Proponents of the voluntary contract approach argue that this arrangement both provides relief to the sincere commercial farmer caught in the inner rings of the metropolitan area and protects lands in the "next suburban ring" outside the cities, thereby reducing leapfrogging.

4) Local government automatic contract renewal. Contracts in California are renewed automatically each year for another full ten-year period unless definite steps are taken to avoid the renewal. This reinforces the long-term aspect of land preservation, as well as the partnership basis of the contract. The property holder under present Connecticut legislation, on the other hand, must make annual application to the local assessor for approval. The two approaches reflect different attitudes regarding land use control.

5) Non-renewal notice; a nine-year forewarning. The decision by either party under California law not to renew the contract puts local assessors, land developers, and town citizens on notice that all can anticipate a change in land use in nine years. The enforceable contract of the preceding year still has nine years before expiration. Again, the law virtually directs a time period for town reflection and planning in anticipation of development.

6) Slide-scale of withdrawal preferential taxation. The California statute calls for a graduated reduction in differential assessment valuations during each year of the remainder of the contract once it enters the non-renewal stage. Thus the property holder pays to the town relatively more of the nonagricultural value of his property as his value increases in anticipation of availability for development.

7) Cancellation of contracts. Cancellation of contracts is possible under the California act but is made intentionally difficult by the legislation. In the case of cancellation, consent is required from all three parties to the contract; the property holder, the local government and the state. Penalties for cancellation are provided and can be compared in intent to the Connecticut conveyance tax. Penalties are not required, however, if the public interest is better served by cancellation. Public hearings and an investigative procedure by state agencies are specified as elements in the exceptional circumstances of contract review for possible cancellation.

APPENDIX B

New Jersey Blueprint Plan for Agriculture

The basic elements of the New Jersey proposal begin with recommended, "adoption of an agricultural open space plan administered jointly by the state and local municipalities."

1) Under the plan, each municipality in the state would be required to designate an Agricultural Open Space Preserve within its boundaries composed of at least 70 percent of its prime farmland. The preserve would become part of the local master plan and should reflect the local community needs for open space and other agricultural benefits.

2) Landowners whose properties are located in a preserved area would be able to sell the development easement to their land to the state administering agency or local government.

3) The rate of compensation for development easements would be the difference between the market value for the land and its farm value.

4) At the option of the landowner, the easements could be held for later sale and the compensation for delayed sales would reflect the increased development value of the easement had the preserved area not been established.

5) The program would be financed by a tax on all real estate transfers in the state. The rate would be 4 mills, or 4/10 of one-percent of the transfer value at the time of the sale. In nearly all instances, the tax would be paid from realized capital gains on the real property transferred.

6) The responsibility for administration of the program would be vested in a Board of Directors composed of persons appointed by the Governor and approved by the Senate and selected ex-officio members of state government. The professional staff would be attached to the Department of Agriculture.

The recommendations are based on the following policy guidelines:

a) The plan should assure the creation of permanent agricultural open space preserves.

b) The agricultural open space preserves should consist largely of prime farmland. The land area so preserved should be of sufficient size to justify the operation of economically efficient agricultural supply, service, and first-processing firms.

c) The constitutional rights of landowners should be protected from confiscatory measures as their lands are included in an open space preserve; and they should be justly compensated for the value of property rights taken from the land.

d) The authority of local municipalities with respect to planning and zoning should be recognized. The determination of the location of lands in an agricultural open space preserve should rest with local municipalities consistent with established guidelines.

e) Land in an open space preserve should remain under private ownership and control even though its use is restricted. Procedures should be established to encourage owner-operated farming. Undue fragmentation of land ownership units should be avoided.

f) The cost of the program should be equitably distributed among those who benefit therefrom.

g) Landowners and others affected by the land use plan should have ready access to review or appeal procedures and have ultimate recourse to the courts if necessary. The standards for determining areas to be preserved, compensation rates, appeal procedures, and the like should be objectively determined.

h) Normal and recommended activities and practices essential to agricultural production should be protected by designating the agricultural land preserve as an Agricultural Priority District, and providing for certain review and public hearing procedures where any public or private action threatens such practices.

i) The plan should be devised to alleviate the immediate impact that inheritance and estate taxes have upon land use, ownership and control.

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"This year alone, as we ponder, another ten to fifteen percent of the state's farms will go out of production. Thousands of acres will be lost; many, within a year, will be buried under concrete. The quality and character of Connecticut will decline. . . the same will happen the next year, and the next . . . UNLESS WE ACT."

In a continuing service to the citizens and the environment of Connecticut, this CCA white paper is published in a volume of 100,000 copies to attain wide distribution and significant impact.

CCA is a statewide, non-profit environmental organization supported solely by dues and contributions. Your membership is earnestly invited. For details, contact CCA headquarters.

GUIDE SHEET #14

THE VANISHING LAND ACTIVITY

As you read the article The Vanishing Land keep a list of the values of agricultural lands, the problems farmers face in keeping their land as farm land and potential solutions to the problem of vanishing agricultural land!

Values of Agricultural Land

1.

2.

3.

4.

5.

6.

7.

8.

Problems

1.

2.

3.

4.

5.

6.

7.

8.

Potential Solution

1.

2.

3.

4.

5.

6.

7.

8.

9.

When you are finished with the activity turn this guide sheet over, and compare your lists with a lists that we prepared in developing the Uplands Unit.

GUIDE SHEET #15

VANISHING LAND ACTIVITY

The information on this guide sheet summarizes the issues in The Vanishing Land

VALUES OF AGRICULTURAL LANDS

- | | |
|---|---|
| 1. Aesthetic values-i.e. open space | 5. Reduces noise pollution |
| 2. Recreational values i.e. hiking, fishing, etc. | 6. Helps to maintain local water supplies Watershed |
| 3. Ecological values | 7. Food production |
| 4. Agricultural land traps air pollutants | 8. Economic contributions |

PROBLEMS

- | | |
|---|--|
| 1. Land value in Connecticut have risen rapidly | 4. Young farmers can not find large resources to start new farm business |
| 2. Farm profits are low | 5. Inheritance tax |
| 3. Farm labor is hard to find | 6. New rules and regulations in an ever changing world |
| 7. New neighbors not understanding farming | |

SOLUTIONS

1. Goal of any program should be to provide for long term preservation of agricultural industry
 - a. by zoning high value agricultural lands for agricultural use only.
 - b. state purchase of development rights to high quality agricultural land.
2. Public Act #490 known as the open space act. Helps farmers and other owners of open space to apply for a use value assessment which can mean a large reduction of taxes.
3. Subsidized Recreational Activities - Many state governments are giving cash to farmers that open their land for the public's use.
4. Marketing Assistance - For example cooperative market locations for fresh vegetables. Along state owned roads or parks. This might be helpful in stimulating sales and consequently, continued or increases production.
5. Labor Assistance - The state, in cooperation with state and federal employment programs, should upgrade and increase training and placement programs for farm labor. The state should advertise and otherwise encourage the jobless to seek work in agriculture.
6. Loan Assistance - The state should establish a low interest revolving loan fund to assist farmers in land acquisition, equipment replacement, and animal purchases which increase farm productivity and/or help new farmers get started.
7. Tax Relief - In addition to P.A. 490-Kinds of Benefits. There should be additional tax relief on farm building construction, equipment, and importantly a substantial reduction of inheritance tax at both state and federal levels for farms that will remain in active agriculture following estate transfer of ownership.
8. Insurance - Reduction in insurance costs for coverage on farm equipment, buildings, animals and labor should be negotiated by the state with private insurance agencies of provided by the state.
9. Education - Additional incentives in the form of grants-in-aid on Educational loans should be made mailable to prospective students intensified in pursuing a career in agriculture.

When you are finished with the activity, turn on the tape recorder!



Guide Sheet # 16

UPLANDS UNIT

Report donated by:
Connecticut Department of
Agriculture



Report of the Governor's Task Force for the Preservation of Agricultural Land



THE TASK FORCE

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HUNTINGTON WILLIAMS, *Chester*, Executive Director Council on Environmental Quality

ARTHUR WOODS, *West Hartford*, President Connecticut Business and Industry Association

GOVERNOR'S TASK FORCE FOR THE PRESERVATION OF AGRICULTURAL LAND

Final Report, December 20, 1974



At a hearing in Brooklyn on the preservation of agricultural land, a man said, "Midas had a lot of gold, but he starved to death."

In North Haven, a woman said, "Land is the tool that a farmer uses to make food."

Another citizen added, "You've got to do more than save farming for just this generation."

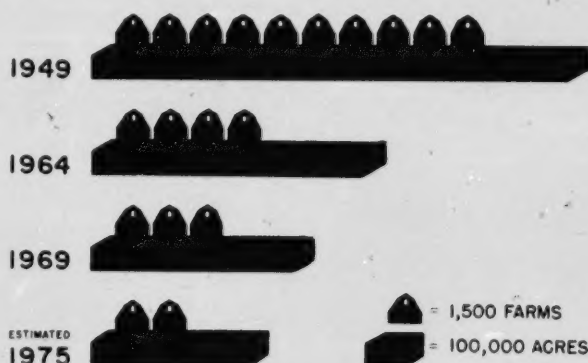
These statements captured the new concern for present and future food. They reflected the realization that most food comes from fertile acres where farmers' toil is combined with the magic of the sun. These citizens knew that groceries are renewable but farmland to grow them on is not. For three years they had been bidding against millions of people abroad for food from the west and had been paying more to have it hauled to Connecticut as fuel prices increased.

Feeling these concerns, knowing that farmland in Connecticut had shrunk by half in 25 years, and seeing the destruction of viable farm areas by scattered development, the Governor of Connecticut, in April 1974, directed 25 people to study and then recommend a land policy to maintain agriculture. During the following months the Governor's Task Force for the Preservation of Agricultural Land pursued its assignment, learn-

ing policies of other governments, receiving suggestions from citizens, and testing ideas at meetings.

Although we, the Task Force, were directed to report in April 1975, our studies showed the loss of farmland so acute that we advanced our schedule and are reporting in December 1974. We begin by setting forth our primary recommendation: preserving fertile land by purchasing development rights.

The Decline of Agriculture



THE CHIEF RECOMMENDATION

To provide about a third of its food, Connecticut should reserve at least 325 thousand of its remaining 500 thousand acres of agricultural land. These acres should be mainly arable land, but may include some adjacent pastures, woods and other land for practical boundaries to control drainage and erosion and to make viable farms.

● The agricultural reserves in a town should be designated by the zoning authority or other duly constituted town body with the advice of

local farmers and under guidelines established by a Connecticut authority for agricultural lands. Following the designation of the reserved area, it should not be available for development. If the town does not act within a year, the Connecticut authority should be empowered to designate it.

● The land within the reserves should be preserved for growing food by the State purchase of development rights. The value of these rights is the difference between the value of the land for

agriculture and its value for other uses. The development rights should be purchased when offered by an owner, and he should retain all the rights of ownership. The purchase procedures should be established by the State authority, allowing the owner to sell rights when he chooses and be paid on an installment plan if he wishes.

- Guidelines to assure maximum food from minimum acres, procedures for purchase of rights, and the administration of the program should be the assignment of an unpaid authority of nine: a) the commissioners of Agriculture, Environmental Protection, and Finance & Control; b) four appointed by the Governor, two being farmers; and c) one named by the President of the Senate and one by the Speaker of the House. No more than three of the six appointees should be from one political party. The members should serve staggered five-year terms. The Chairman of the authority should be elected annually from among the six appointed members by the vote of all members. The Chairman with the approval of the Governor and members of the authority should appoint an Executive Director, who should be an employee of the authority at a salary prescribed by them and who should have the power of appointing staff.

VALUE OF FARM LAND

VALUE OF LAND
FOR AGRICULTURE

VALUE OF DEVELOPMENT RIGHTS

DEVELOPMENT RIGHTS are the difference between the value of land for growing food and its value for development.

- The purchase of development rights in the reserves should be financed by the issuance of bonds under the full faith and credit of the State. The bonds should be issued as needed under a maximum authorization of \$500 million.
- The development rights should be held forever by the State unless relinquished by mutual approval of the owner, a town referendum and the State authority.

Having learned the verdict of the Task Force, the reader will now want to know the evidence. This is set down as it was gained: an inventory of our resources for producing food, the social and economic forces upon agriculture, and alternative policies for keeping our arable acres.

AN INVENTORY OF LAND AND PEOPLE

The essential step in getting our food is growing green plants for food or feed, and this depends upon natural gifts. The gifts of ample rain, bright sun and moderate temperatures are given to us now much as they were to the Mohicans and their Algonquian kin who preceded us. The generosity of Providence in these gifts is not, however, matched by her generosity in the final essential gift, abundant arable or plow-able land.

A hunter trying to find an animal in the woods or a farmer trying to sustain animals on rough pasture knows that it takes a plow and arable land to grow abundant feed or food. Most of our acres are unfit for the plow as testified by stonewalls and ledges. And we are left with a small and thus valuable gift of land where sun and rain can be efficiently transformed into food.

How Much Good Land?

A soil surveyor can identify this priceless soil with auger and spade, he would say it had Capability Class 1, 2, or 3, and he can make an inventory.

Fortunately, immigrants from Europe and their offspring have been testing Connecticut soil for about a dozen generations, keeping the arable soil under the plow, and abandoning the other to brush and then trees. Thus our present agriculture shows us where much of our fertile soil is and how little we have.

Inventories of Connecticut land during 1967-70 agree that we have about 300 to 400 thousand acres of open agricultural land. Using the 1969 Census of Agriculture and the 1972 Crop, Livestock and Marketing Review, one can

refine this to 163 thousand acres of harvested crop land and 125 thousand acres of pasture. One must remember that to encompass this fertile soil in the varied farmland of Connecticut, farmers own about 500 thousand acres.

A rough inventory of farmland among the 3 million acres of Connecticut hills and valleys shows 16% in farms: 5% produces crops, 4% is pasture and the remaining 7% ties the farms together. We have precious little farmland to preserve, and its preservation will leave plenty of land for our other needs.

How Much Food?

The next question is: "How much of our food do we get from these few acres?" The answer is "a great deal" for we have more agricultural production per square mile than any other New England state.

Dairying uses about two-thirds of the cropland and pasture in Connecticut. This land, plus increasingly expensive feed from the Grain Belt, produces nearly half the milk we drink. As feed becomes more expensive, there is an advantage to all from having more arable land for dairy farmers and thus less expensive feed shipped in.

Poultry is our most productive product in dollars, but unfortunately chickens get little feed from our land. Eggs would be cheaper if they did.

Connecticut Farm Products 1972



● EACH SYMBOL REPRESENTS \$ 5 MILLION



Horticulture uses only arable land, but it is vital in producing food directly for people. On only 32 thousand acres or 1 percent of Connecticut's area it produces a third of our fresh vegetables and potatoes, all of our apples, grows trees, shrubs, and sod for landscaping, and tobacco for a good cigar, besides.

How Many People?

The other side of the food equation is people. Our population increased about a fifth from 1960 to 1970, reaching over 3 million or one per acre in 1970.

The final step in our inventory is estimating how much land should be reserved to produce roughly a third of the milk, eggs, vegetables, potatoes and apples that we shall consume. This is, of course, about what we produce today. The forces affecting the amount of land we shall need are changes in amount of meat and milk versus plants that we eat, changes in population, and changes in yield.

Because a pound of feed does not make a pound of meat—or even milk or eggs, we clearly could feed more people if we ate less meat. Before we expect to gain much acreage by becoming vegetarians, however, we must remember three things: some eggs and milk are good for us; poultry and dairy cattle, as grown in Connecticut, are relatively efficient converters of feed to food; a



cow can make milk for us out of grass that we cannot digest. We, therefore, take the conservative course of not predicting any large changes in the milk and eggs that we shall eat tomorrow and thus no great decrease in acreage for feeding animals.

Although the recent one-fifth increase in population in a decade leads to frightening projections, there is evidence in our declining birth rates that we shall not multiply until we trample one another. Thus in planning for food there is reasonable safety in expecting a doubling of our numbers rather than an explosion.

How Much Food Per Acre?

Can farmers and scientists increase yields per acre to feed these greater numbers? Some may think at once of "factory farms" where plants are grown on a small area and under lights. But growing plants outdoors is an efficient way of converting solar energy to food, and the energy crisis surely dooms any plans to move plants indoors and use fewer arable acres.

Arable acres can often, of course, be managed more intensively to yield more. Making improvements for a year or two until the bulldozer comes in, however, is depressing. But when farmers know that they and farmers to come will be forever growing food on precious land, they can invest, improve, and increase yields.

More efficient plans for converting sun to

food on arable land and more efficient animals for converting plants to protein are also good bets. With an Experiment Station in New Haven that has invented hybrid corn and one in Storrs that has developed high-energy poultry feeds and with industrial research in both crops and poultry, Connecticut is well fixed to increase the efficiency of its agriculture. The record for America, produced in significant part by Connecticut research, shows yields of corn have been increased by about half in a decade and soybeans by a sixth.

If we make farm ownership secure and work hard at our Experiment Stations, we can reasonably hope to increase our yields as our population increases and thus continue growing a third of our food from the acres we use today. But to expect more would be reckless.

By this reasoning we arrived at our recommendation: To produce a substantial part, about a third, of our food for years to come, Connecticut should reserve at least 325 thousand acres for agriculture.

What Will It Cost?

Finally, the inventory requires an estimate of the cost of buying development rights. By examining farm sales in Connecticut's 169 towns in 1973, the Task Force and the Southern New England Farm Credit System estimated that the cost of these rights would average \$1500 an acre, more in some localities, less in others. Hence the estimate that reserving 325 thousand acres for food would eventually cost \$500 million.

Because the preservation of agricultural land is a State program, it should be paid for by a State tax. The preservation of agricultural land will improve the quality of life in all Connecticut and thus increase the value of all real estate.

The preservation should be financed by a 1% tax on all real estate transfers.

The total sales of real estate in Connecticut are estimated at about \$3 billion, and this would produce roughly \$30 million per year. If, as indicated to the Task Force in meetings with land owners, only a small portion of development rights would be offered yearly, the project would, under such circumstances, be currently liquidated because the revenue from the transfer tax could be sufficient to pay for the rights as offered.

PRESSURES ON AGRICULTURE

Despite the tenacity of the Connecticut farmer, sometimes on land granted long ago by the British Crown, and despite foresighted programs for open space, great economic and social forces are eroding our arable acreage. The Task Force diagnosed these before making its primary recommendations. Secondary recommendations are, of course, called for and are added below as the forces are analyzed.

Although greater in some towns than in others, the difference between agricultural value and the price of building lots has caused arable land to be sold for other uses and prevented its purchase by new farmers. Heretofore when times were hard, farmers had to live on less or sell out cheap and look for a job in town. The advent of autos and suburbs, however, has brought developers to the farmers' doors with cash in hand to wean them from 16-hour days and subsistence incomes. Land prices have been the primary force in decreasing our farmland by half in a quarter century, and the purchase of development rights is designed to stem it.

Taxes

The next force is taxes. Taxing farm land according to its use rather than its developable value was and is critical in slowing the year-to-year depletion of arable acres.

Public Act 490 complements our primary recommendation, and it should be continued.

Inheritance taxes cause the loss of farm land between generations. By decreasing the inherited value of farm land, the purchase of development rights will decrease inheritance taxes on the land.

Marketing

A study of marketing revealed that produce is sometimes produced in Connecticut, warehoused out-of-state, and returned to Connecticut for use. Consumers have complained of a lack of freshness, and farmers and consumers have both complained of a widening "middle-man's" spread between them.

To increase the efficiency of marketing, farmers should strive to sell directly to the consumer or to Connecticut retailers, and govern-

ment regulations should not trammel this efficient process.

Farm Labor

Working on the farm has peculiarities. The hours must suit the season, the weather and the crop because the farmer is capturing sunlight in food outdoors. The tedious stooping, inclement weather and changing hours decrease the number of people willing to do the consumer's work on the land.

An agricultural labor act should be enacted, providing rules appropriate to farming. These rules must assure the timely harvest of perishable food, secret votes on union recognition, and the outlawing of secondary boycotts.

Working Together

The long neglect of health and environment has come to an end. Now we must guard against regulation that protects our health and environment little while costing people much. Our family farms that we praise are particularly susceptible to the burdens of complex regulation.

Health and environmental regulation of food production must be reviewed constantly to eliminate harassments that increase cost with little benefit to the consumer.

Although the consumer is the beneficiary,



farmers alone must often protect agriculture from unwitting destruction by social and economic forces. Effective action depends upon effective organization.

Farmers should work together through agricultural organizations and cooperatives to protect food production.

The production of food at State institutions has declined.

State farms should be rejuvenated, providing salutary work and valuable food for people in the institutions, or leased for food production.

Support for Farms

The decrease in farm land makes the network for distribution of agricultural services and

supplies thinner and more costly. The farmer's search for machinery parts, for example, is becoming ever more time-consuming. Making Connecticut agriculture viable by following our recommendations will make farm supplies and services easier to find.

Happily some forces are favoring Connecticut agriculture. Credit is available when the ability to produce is established, and some farmers even worry that it might be too easy, encouraging young people to go over their heads in debt. Another thing in good supply is educated youth: vocational high schools and the college of agriculture have ample enrollment. The young farmers are ready to grow our food if they can afford the cropland.

ALTERNATIVE POLICIES

Before resting our case, we should enumerate policies that have been culled out so that readers can understand why we have chosen the preceding recommendations.

1 The easiest policy now is to allow present economies to work their will with present farmers passing on and the stick of inheritance taxes and the carrot of developers' prices dispersing our arable acres. Because many cities are surrounded by cropland that nurtured them and because arable land is eminently build-able land, the best acres will go early. Then when we need the land to feed us, it will be irretrievably subdivided into lots and crisscrossed with paving. The Task Force discarded this alternative.

2 The sternest policy for preserving land is outright purchase by the State for lease to farmers. Because the sharp eye of the owner is the best fertilizer, we have discarded this alternative, choosing the fruitful compromise of purchasing development rights.

3 Given the purchase of development rights in agricultural reserves, we could have recom-

mended the designation of the reserves by the State, perhaps in the less thickly settled corners of Connecticut. It seemed to us that townspeople would know their land well. Within guidelines guaranteeing fertile land be acquired, the towns should choose well. Further, every town should have the opportunity to designate an agricultural reserve that fits their town plan.

4 A program of buying all rights offered and designating no areas for reserves could have been recommended. This, however, would have fragmented the land until it was impractical to farm, and we recommended the designation of agricultural reserves.

Thus we arrived at our chief recommendation: to maintain her characteristic quality of life and provide about a third of her food, Connecticut should purchase development rights in agricultural reserves designated by the towns according to guidelines set by the State to ensure the preservation of about 325 thousand fertile acres. The Task Force urges that the Legislature enact the necessary bill and that the Governor sign it into law.

GUIDE SHEET #17

MATRIX SUMMARY OF POTENTIAL PROBLEMS OF ON-SITE CONSTRUCTION IN UPLANDS

Type of Area	Activity	Natural Functions	Harmful Effects
Hillside Forest	Logging or clear-getting	Habitat for wildlife Valuable renewable resources Natural water storage and purification area Aesthetic and recreation area	Soil erosion and water and mineral Loss Reduced water holding capacity and consequent downstream flooding Loss of Wildlife
Ridge Forest	Ridge Top Road Construction	Habitat for wildlife Valuable renewable resources Natural water storage and purification area Aesthetic and recreation area Promotes biological diversity and maintenance of natural processes	Natural Ecosystem Impairment and Loss Roadside pollution of vegetation from auto exhaust Aesthetic impairment
Hillside Forest	Hillside Cluster Development	Wildlife habitat area Natural ecosystem Water and soil holding area Aesthetic and recreation area	Downslope pollution from septic sewer system Erosion and sediment production from housing and parking area Extensive grading alters natural habitat
Forest	Wildlife Refuge	Provision of large chunks of natural areas for optimum wildlife production Aesthetic area	Sore habitat manipulation for optimum production of wildlife- otherwise best means of preserving natural upland areas
Forest	Nature Center	Aesthetic and recreation area Natural ecosystem Education and recreation Water and sediment control	Habitat Manipulation for maximum human usage of area Encourage Influx of people into an otherwise natural habitat with consequent habitat littering and destruction
Farm	Industrial Park	Production of agricultural crops Natural water storage and purifier area Aesthetically pleasing	Heavy industrial air and water pollution of surrounding area Aesthetically displeasing
Farm	Standard Subdivision	Production of agricultural crops An open space buffer area Natural water storage and purifier Aesthetically pleasing	Erosion of fertile agricultural soil, sediment and litter production Construction of service facilities will cause additional loss to open space
Farm	Parking lot	Production of agricultural crops An open space buffer area Natural water storage and purifier Aesthetically pleasing	Pollution of oils, sediment, debris and litter from vehicles Frost action on pavement Rapid water runoff from surface- no water holding capacity

GUIDE SHEET #18

OUTLINE OF UPLAND FUNCTIONS AND VALUES

1. Upland areas provide a diversity of landscapes which we find appealing and which add too our "quality of life" environment.
2. Upland areas offer opportunities for a variety of recreational oportunties such as hiking, camping and hunting.
3. Upland areas such as forests offer a diverse, stable system with a built in capacity for self-maintance and regeneration.
4. Uplands are areas of high biological productivity. Animals such as deer, grouse and rabbits utilize a variety of upland habitats to obtain food, shelter and as a place to rear their young.
5. Uplands, particularly forests and farms. are inmortant for watershed protection.
 - a. Uplands prevent soil erosion, thus keeping water clean and free of soil.
 - b. Upland vegetation protects soil from heating action of raindrops, keeping soil loose and friable.
 - c. Uplands soils act as a sponge to absorb quantities of water.
 - d. Upland soils and vegetation absorb melting snows in spring, thereby preventing spring floods.
6. Upland forests are valuable sources of lumber for housing and furniture construction.
7. Upland farms, orchards and nurseries are productive agricultural areas which greatly contribute to the state's economy.
 - a. Farms produce perishable goods for local markets
 - b. Farms provide a cheap local food supply potentially useful in case of future food shortages
 - c. Farms provide employment opportunities and therby strengthen the states labor economy
8. Upland areas are educationally valuable locales for nature study and scientific research.

This is an incomplete list which illustrates several of the important functions of uplands. See how many upland roles and functions you can add to the list.

WORDS WORTH KNOWING

UPLAND ECOSYSTEMS AND LAND USE PLANNING

- Agriculture:** The managed production of any form of grown farm goods.
- Diversity:** The variety of organisms found in a community
- Ecosystem:** Totality of plants and animals present in an area interacting directly or indirectly with one another and with their environment. A somewhat arbitrary categorization and may be quite small, as in a rotting log ecosystem, or quite large as in a tropical rain forest.
- Erosion:** Loss of soil particles due to water run off.
- Forest:** An ecosystem which is dominated by trees, which gives it it's distinctive structure. In Connecticut, we may distinguish between a Deciduous Forest, which annually sheds its leaves, and a Coniferous Forest, which is evergreen.
- Monoculture:** The cultivation of a single species of plant or, relative to livestock, the raising of one species of animal.
- Multiple Use:** A concept which suggests that natural areas should be opened for a variety of uses, eg. hunting, hiking, photography and timber production.
- Open Space:** All areas which are not currently part of the human industrial and residential sphere.
- Productivity:** Refers to the amount of new biomass added to an ecosystem per unit of time.
- Resource:** A material needed by organisms for their well being.
- Stability:** Absence of fluctuations. Implies some degree of self regulation and permanence.
- Succession:** The replacement of one community by another kind. A progressive series of changes of plants and animals which may culminate in a stable community. The stable community is then called a CLIMAX COMMUNITY.
- Upland:** All types of topography other than depressions occupied by lakes, swamps, or in close proximity to rivers, streams, and seas.
- Watershed:** The drainage area of a river or lake.

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A capsule presentation of the ecology of major ecosystems. Includes energy flow, nutrient cycling, succession and evolution.

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Highly Recommended

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A through overview on land user policies and practices.

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An excellent paper detailing the step by step loss of such open space areas on farm and woodland in Connecticut. Highly Recommended

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A thorough ecological treatment of the plant and animal constituents of North American Ecosystems and their variations. Recommended for those needing descriptive information on ecosystems.

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A collection of papers detailing various aspects of land use. See especially sections on farming, forests and wildlands. Recommended.

Vandermillen, Edmund J. Forestry in Connecticut. DEP Pamphlet.

A pamphlet which gives an interesting and informative history of Connecticut forests.

Watt, K.E.F. 1972. Principles of Environmental Science. McGraw Hill. New York. 348 pp.

Excellent chapters on forests, watersheds and rangelands. Recommended.

Audio Tape Script

UPLANDS

1

INSERT SLIDE # 1

"FROM MOUNT HOLYOKE, ON THE SOUTHERN SIDE OF THIS TOWNSHIP, AT THE DISTANCE OF THREE MILES FROM THE CHURCH, IS SEEN THE RICHEST PROSPECT IN NEW-ENGLAND, AND NOT IMPROBABLY IN THE UNITED STATES. THE MOUNTAIN IS ABOUT ONE THOUSAND ONE HUNDRED FEET ABOVE THE SURFACE OF THE RIVER; BUT IN THE PLACE OF ASCENT IS OF SO GRADUAL AN ACCLIVITY, THAT TWO-THIRDS OF THE ELEVATION MAY BE EASILY GAINED ON HORSEBACK. ON THE HIGHEST PART OF THE SUMMIT, THE INHABITANTS HAVE CLEARED AWAY THE TREES AND SHRUBS, SO AS TO OPEN THE PROSPECT IN THE MOST ADVANTAGEOUS MANNER. FROM THIS SPOT THE EYE IS PRESENTED WITH A VAST EXPANSION TO THE SOUTH, COMPREHENDING THE SOUTHERN PART OF THE COUNTY OF HAMPSHIRE, AND A PORTION OF THE STATE OF CONNECTICUT. THE MIDDLETOWN MOUNTAINS, THE BLUE MOUNTAINS AT SOUTHTON, BOTH AT THE DISTANCE OF SIXTY MILES, AND THE WHOLE EXTENT OF THE CONNECTICUT VALLEY TO MIDDLETOWN, TOGETHER WITH THE LONG RANGES BY WHICH IT IS BORDERED, APPEAR IN FULL VIEW. THE VARIETY OF FARMS, FIELDS, AND FORESTS, OF CHURCHES AND VILLAGES, OF HILLS AND VALLIES, OF MOUNTAINS AND PLAINS, COMPRISED IN THIS SCENE, CAN NEITHER BE DESCRIBED NOR IMAGINED."

WITH THIS EXCERPT FROM TIMOTHY DWIGHT'S, TRAVELS IN NEW ENGLAND AND NEW YORK, PUBLISHED IN 1821, WE WELCOME YOU TO THE AUDIO-TUTORIAL UNIT ON UPLANDS. IN THIS UNIT, WE WILL BE LOOKING AT SOME OF THE ECOLOGICAL FEATURES OF UPLANDS; WHAT THEY CONSTITUTE, WHERE THEY ARE FOUND, WHAT THEY CONSIST OF, AND WHY THEY ARE VERY IMPORTANT ECOLOGICAL ENTITIES WHICH SHOULD BE BOTH THOROUGHLY STUDIED AND CAREFULLY MANAGED. Slide #1

THE SCENE YOU HAVE BEEN LOOKING AT IN SLIDE #1 SHOWS TWO TYPES OF UPLAND AREAS, AN UPLAND FOREST AND AN UPLAND MEADOW . . . SLIDE # 2 SHOWS AN ADDITIONAL TYPE OF MAN MANAGED UPLAND AREA . . . A FARM. SLIDES ONE AND TWO HAVE SHOWN UPLAND SCENES THAT ARE TYPICAL OF MUCH OF THE NORTHEAST. slide #2

DO YOU SEE ANY COMMON CHARACTERISTICS OF THE TWO SCENES WHICH MIGHT PROVIDE A DESCRIPTION OF UPLANDS? (PAUSE) LET'S COMPARE YOUR OBSERVATIONS TO THOSE OF SCIENTISTS INVOLVED IN STUDYING UPLAND AREAS. TWO TYPES OF SCIENTISTS WHO ARE INTERESTED IN DESCRIBING AND INVESTIGATING UPLANDS ARE GEOLOGISTS AND BIOLOGISTS. GEOLOGISTS DESCRIBE UPLANDS IN TERMS OF THEIR TOPOGRAPHY AND SOIL TYPES. TO THE GEOLOGIST, AN UPLAND MAY BE ANY AND ALL TYPES OF TOPOGRAPHY OTHER THAN WATER FILLED DEPRESSIONS. GEOLOGICALLY UPLANDS ARE CATEGORIZED AS HILLS, SLOPES, RIDGES, DRUMLIN AND PLATEAUS, ALL OF WHICH HAVE ELEVATED, WELL DRAINED SOILS. TO A GEOLOGIST SUCH AREAS AS LAKES, MARSHES, PONDS, RIVERS AND STREAMS WOULD NOT BE UPLAND ECOSYSTEMS, ALTHOUGH THEY MAY OCCUR IN DEPRESSIONS IN THE MIDST OF UPLAND AREAS.

BIOLOGISTS DESCRIBE UPLANDS IN TERMS OF THE PLANTS AND ANIMALS WHICH ARE TYPICALLY FOUND IN SUCH AREAS. TO THE BIOLOGIST UPLANDS INCLUDE THE OAK-MAPLE OR HICKORY FORESTS WHICH COVER RIDGES AND HILLS, AND THE SUN-FLOWER CARPETED FIELDS AND MEADOWS. OTHER UPLAND COMMUNITIES WOULD INCLUDE THE CEDAR AND ALDER BRUSH LAND, FARMS AND PASTURES, ORCHARDS AND NURSERIES.

A GOOD WORKABLE DEFINITION OF UPLANDS WOULD UNDOUBTEDLY HAVE TO INCORPORATE GEOLOGICAL AND BIOLOGICAL PARAMETERS.

AS WE BEGIN OUR STUDY OF UPLANDS, IT MAY BE HELPFUL TO SEE HOW UPLANDS RELATE TO OTHER MAJOR LAND AREAS. FOR MOST PURPOSES, LAND CAN CONVENIENTLY BE DESCRIBED IN TERMS OF THREE BROAD CATEGORIES: UPLANDS, (PAUSE) INLAND WETLANDS (PAUSE) AND COASTAL WETLANDS (PAUSE). NO SHARP LINES OF DEMARCATION SEPARATE THE THREE LAND TYPES, ALTHOUGH EACH MAY READILY BE DISTINGUISHED FROM EACH OF THE OTHERS. THE PATTERN OF THE THREE LAND TYPES FORMS A CONTINUUM FROM THE UPLANDS TO THE LOWLANDS TO THE COASTAL WETLANDS.

LOCATED ON GUIDE SHEET # 2 IS AN ILLUSTRATION OF THIS CONTINUUM. YOU CAN SEE THAT FORESTS COVER THE HIGH RIDGES AND STEEPER HILLS IN THE BACKGROUND. ON THE LESS STEEP SLOPES ARE FOUND FARMS, MEADOWS, PASTURES AND WOODLOTS. ALL OF THESE MAY BE CONSIDERED TO BE TRUE UPLAND AREAS. FURTHER DOWN THE SLOPES INTO THE G.S. #2

VALLEYS THE SOILS BECOME PROGRESSIVELY WETTER AND SUPPORT MORE WATER TOLERANT VEGETATION, HERE MAY BE FOUND PONDS AND MARSHES, WHICH ARE INLAND WETLANDS, EVEN THOUGH THEY MAY BE FOUND IN UPLAND AREAS. THESE ARE DRAINED BY STREAMS. THE STREAMS OF THE UPLANDS BECOME RIVERS OF THE LOWLANDS. THE LOWLAND RIVERS SLOW DOWN AS THEY SLUGGISHLY ENTER THE SEA, AND FREQUENTLY FORM VAST SALT MARSHES, SUCH AS ARE SHOWN IN THE FOREGROUND. THESE ARE THE COASTAL WETLANDS, AND THE CONTINUUM FROM THE UPLANDS TO THE COASTAL AREA IS COMPLETED. OTHER UNITS IN THE KIT DEAL WITH INLAND AND COASTAL WETLANDS.

A SUMMARY OF UPLAND CHARACTERISTICS IS PROVIDED FOR YOU AT THE BOTTOM OF GUIDE SHEET # 2.

LOOK AT GUIDE SHEET # 3A. GUIDE SHEET 3A DISPLAYS A MAP OF THE GENERAL TOPOGRAPHICAL G.S. #3 FEATURES OF THE STATE OF CONNECTICUT. NOTE THAT CONNECTICUT IS SUBDIVIDED INTO THREE BROAD TOPOGRAPHIC FORMS: COASTAL LOWLANDS, CENTRAL LOWLANDS, AND THE EASTERN AND WESTERN UPLANDS. THE UPLANDS CONSIST OF LONG, PARALLEL RIDGES AND HILLS SEPARATED BY VALLEYS. FREQUENTLY THESE VALLEYS HAVE STREAMS OR RIVERS, SUCH AS THE HOUSATONIC RIVER IN THE WESTERN UPLANDS AND THE SHETUCKET RIVER IN THE EASTERN UPLANDS. THE RIDGES AND HILLS OF THE EASTERN AND WESTERN PORTIONS OF THE STATE FALL WITHIN OUR DEFINITION OF UPLANDS

IN CONTRAST TO THE UPLANDS A LOWLAND PLAIN OR VALLEY RUNS DOWN THE CENTER OF CONNECTICUT, SEPARATING THE HILLY EASTERN AND WESTERN PORTIONS OF THE STATE.

SLIDE # 3 WAS TAKEN IN CONNECTICUT'S WESTERN UPLANDS NEAR LAKEVILLE. THIS AREA NOT FAR FROM THE UPPER HOUSATONIC RIVER SHOWN IN GUIDE SHEET # 3. SLIDE # 3 SHOWS THE SCENIC COUNTRY-^{slide #3} SIDE TO BE FOUND ALMOST ANYWHERE IN THE CONNECTICUT UPLANDS. IN THE SLIDES YOU WILL OBSERVE TYPICAL UPLAND AREAS SUCH AS FOREST, MEADOW, AND FARMS. SUCH SCENES CONSTANTLY REPEATED THROUGHOUT THE INTERIOR OF CONNECTICUT REVEAL THE COUNTRYSIDE TO BE A CONTINUING MOSAIC OF FARMS, MEADOWS AND FORESTS.

SOME UPLAND AREAS ARE MORE MODIFIED OR PERHAPS LESS NATURAL THAN OTHERS. FOR EXAMPLE, THE RIDGETOP FORESTS ARE AT THE PRESENT TIME, NATURAL AREAS LITTLE MODIFIED BY HUMAN ACTIVITY. THEY DO NOT, HOWEVER, REPRESENT VIRGIN TIMBER STANDS. THE EARLY COLONISTS CUT OVER ALMOST ALL OF CONNECTICUT'S FORESTS FOR FIREWOOD AND CONSTRUCTION PURPOSES. WHAT FORESTS WE OBSERVE TODAY ARE SECONDARY REGROWTH FORESTS. FARMS AND PASTURES ARE OTHER FORMS OF MAN CHANGED UPLAND AREAS. THAT IS, THEY ARE AREAS WHICH SUPPORT DISTINCTIVE TYPES OF PLANTS AND ANIMALS DIRECTLY THROUGH MAN'S ^{slide #4} ACTIVITIES. NOW LOOK AT SLIDE #4. A SURVEY OF UPLAND AREAS REVEALS OTHER INTENSELY MODIFIED AREAS SUCH AS POWER LINES, RAILROAD RIGHTS OF WAY, AIRPORTS, GOLF COURSES, SKI AREAS AND EVEN SNOWMOBILE TRAILS. THE POWER LINE YOU SEE IN SLIDE #4 SUPPORTS A UNIQUE SET OF BIOLOGICAL COMMUNITIES.

WE OUGHT FIRST TO POINT OUT THAT THERE ARE MANY DIFFERENT VIEW POINTS CONCERNING THE VARIOUS USES OF UPLANDS AND THE RELATIVE VALUES OF EACH USE. DEPENDING ON OUR PERSONAL VALUES, EACH OF US TEND TO ASSIGN PRIORITIES TO THE VARIETY OF USES THAT MAY BE MADE OF UPLANDS. THEREFORE, AS WE PROCEED THROUGH THIS UNIT, YOU MAY WANT TO KEEP A LIST OF THE ECOLOGICAL ROLE OF UPLANDS AND UPLAND USES. WE WILL ASK YOU TO RANK ORDER THESE USES INTO VITALLY IMPORTANT, MODERATELY IMPORTANT AND LESS IMPORTANT CATEGORIES. THE ACTIVITY ON GUIDE SHEET #3B WILL HELP YOU IN THIS PROCESS. FEEL FREE TO ADD NEW UPLAND TYPES OR USES TO EXPAND THE LIST. STOP THE RECORDER WHILE YOU COMPLETE THE ACTIVITY ON GUIDE SHEET #3B. (PAUSE) WE WILL

FOCUS OUR ATTENTION ON UPLANDS AND THEIR USES AND VALUES BY CONCENTRATING ON THE TWO MOST COMMON TYPES OF UPLANDS IN CONNECTICUT: (1) A COMPLETELY NATURAL UPLAND AREA, THE FOREST, AND, (2) A MAN MODIFIED UPLAND SYSTEM, THE FARM.

HISTORICALLY, MAN HAS ALWAYS BEEN AWARE OF THE BEAUTY AND SOLITUDE OF FORESTS. TODAY, WE SEEM TO FIND FORESTS APPEALING BECAUSE THEY PROVIDE US WITH SCENIC DIVERSITY AND QUIET RETREATS FROM OUR DAILY ACTIVITY. IN THE FORESTS, WE OFTEN FIND RELAXATION IN THE FORM OF SUCH RECREATIONAL ACTIVITIES AS BIRD WATCHING, CAMPING, FISHING, HIKING AND HUNTING.

THE ECOLOGICAL DIVERSITY OF FORESTED AREAS PROVIDES PRODUCTIVE HABITAT FOR A BROAD SPECTRUM OF WILDLIFE. IT IS THIS SAME DIVERSITY WHICH MAKES THE FORESTS SUCH INTERESTING LAND AREAS FOR MAN TO EXPLORE AND ENJOY.

THUS THE VALUE OF FORESTS WHICH WE HAVE CONSIDERED HELP TO IMMEASURABLY IMPROVE THE "QUALITY OF LIFE." WE SEE THESE VALUES REFLECTED IN THE ATTITUDE OF MODERN MAN IN THE CURRENT "BACK TO THE LAND MOVEMENT" IN WHICH CITY DWELLERS ARE ABANDONING THE CITY ENVIRONMENT FOR THE RURAL ENVIRONMENTS TYPIFIED BY FORESTED UPLANDS.

THE HISTORY OF CONNECTICUT'S FORESTS, INDICATE THAT THEY HAVE NOT ALWAYS FIGURED SO PROMINENTLY AS OBJECTS FOR PRESERVATION AND RECREATION.

WHEN THE FIRST COLONISTS ARRIVED, ALMOST ALL OF CONNECTICUT WAS COVERED BY HARDWOOD AND EVERGREEN FORESTS. EXCEPT FOR PORTIONS OF THE COASTAL LOWLANDS AND AREAS ALONG RIVER COURSES, THE STATE WAS ONE HUGE FORESTS, BROKEN ONLY BY SMALL CLEARINGS MADE BY THE INDIANS FOR VILLAGES AND FILLED FIELDS. THE FOREST WAS SO DENSE THAT TRAVEL WAS POSSIBLE ONLY ALONG WATERWAYS AND BY INDIAN TRAILS THROUGH THE WOODS.

THE IMMEDIATE CONCERN OF THE EARLY COLONISTS WAS SURVIVAL. SO THEY USED THE FORESTS INTENSIVELY AND GAVE NO THOUGHT TO FOREST PRESERVATION. TREES WERE FELLED TO PROVIDE LUMBER FOR HOME AND FIREWOOD FOR FUEL. MUCH TIMBER WAS EXPORTED OVERSEAS TO EUROPEAN COUNTRIES. SOME WAS UTILIZED FOR SHIP BUILDING. FOR EXAMPLE, THE ESSEX, A FAMOUS FRIGATE OF THE WAR OF 1812 WAS CONSTRUCTED FROM CONNECTICUT OAK IN ESSEX, CONNECTICUT.

AS EACH CONNECTICUT INDUSTRY EXPANDED, MUCH OF THE FOREST'S WERE CUT AND THE WOOD UTILIZED TO CREATE ENERGY FOR THE SMELTING OF IRON AND BRASS. BY THE EARLY 1800'S DOMESTIC, COMMERCIAL AND INDUSTRIAL USE HAD CONSUMED ALMOST ALL OF CONNECTICUT FORESTS AND TREES WERE SPARSE. AN EXAMPLE OF THIS IS READILY EVIDENT BY COMPARING A SLIDE OF THE CITY OF NEW HAVEN AS IT APPEARED IN THE 1800'S WITH ITS APPEARANCE TODAY. TAKE A LOOK AT SLIDE # 5. NOTE THE SPARSITY OF TREES IN AND AROUND THE CITY. NOW THAT REFORESTATION HAS OCCURRED YOU CAN JUDGE FOR YOURSELF WHICH SCENE IS MORE APPEALING; NEW HAVEN THEN OR NEW HAVEN TODAY, shown in slide # 6. Stop the recorder while you compare slides # 5 & 6 of New Haven in early 1800's with slide # 6 showing New Haven today.

WHY DID REFORESTATION OCCUR? THE ANSWERS MAY BE FOUND IN THE ECONOMICS OF CHANGING LAND USE PATTERNS AND A GROWING AWARENESS OF THE IMPORTANCE OF FORESTS AND FORESTRY. RECURRENT RECESSIONS AND DEPRESSIONS DURING THE 1800'S CAUSED THE ABANDONMENT OF MARGINAL FARMS. OTHERS WERE ABANDONED WHEN THEIR OWNERS TOOK FACTORY JOBS SPAWNED BY THE GROWING IN-

DUSTRIAL REVOLUTION OR JOINED THE GREAT WESTWARD MIGRATIONS. THE LAND LEFT BEHIND REVERTED TO WOODS, THROUGH A NATURAL, ECOLOGICAL PROCESS CALLED SUCCESSION, WHICH WE WILL DISCUSS LATER IN THIS UNIT.

IN THE EARLY 1900'S LEGISLATION WAS PASSED WHICH MADE FORESTS ATTRACTIVE ECONOMIC INVESTMENTS. FOR EXAMPLE, WITH THE SUPPORT AND ENCOURAGEMENT OF PROFESSIONAL FORESTERS FROM YALE AND THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION, THE STATE PASSED THE FOREST TAX LAW IN 1913. THIS LAW MADE IT POSSIBLE FOR LANDOWNERS TO DEFER TAX ON TIMBER UNTIL THE TREES WERE ACTUALLY CUT, THEREBY ENCOURAGING THE PRESERVATION OF FORESTS.

EFFECTIVE FOREST FIRE CONTROL MEASURES, WHICH WERE FIRST INTRODUCED IN 1921, ALSO HELPED BY GREATLY REDUCING THE AMOUNT OF TIMBER OTHERWISE LOST IN FREQUENT FOREST FIRES.

RECENTLY LAWS HAVE BEEN ENACTED WHICH ALLOW THE PURCHASE AND PRESERVATION OF FORESTED LAND PUT UP FOR SALE.

AS A RESULT OF THESE MEASURES, CONNECTICUT TODAY IS HEAVILY FORESTED, DESPITE THE FACT THAT IT IS THE FOURTH MOST DENSELY POPULATED STATE IN THE COUNTRY. APPROXIMATELY 50% OF CONNECTICUT'S 3 MILLION ACRES ARE COVERED WITH FORESTS. THE PRESENT FORESTS ARE IN THE FORM OF FARM WOODLOTS, FORESTS COVERING HILLS AND STEEP SIDED RIDGES, AND STATE PARKS AND FORESTS.

MANY CONNECTICUT FORESTS ACTUALLY OWE THEIR EXISTENCE TO THEIR LOCATION ON STEEP SLOPES, ROCKY HILLSIDES AND OTHER RELATIVELY INACCESSIBLE SITES. THESE FORESTS HAVE BEEN LEFT IN THEIR NATURAL STATE SIMPLY BECAUSE THEY COULD NOT BE READILY OR ECONOMICALLY UTILIZED. WE ARE FORTUNATE IN THIS RESPECT BECAUSE THESE FORESTS, IN THEIR PRESENT, INTACT STATE, ARE FAR MORE VALUABLE THEN THEY WOULD BE IF THEY HAD BEEN CUT DOWN AND CONVERTED TO LUMBER. THESE FORESTS, OVER THE YEARS, HAVE CONTRIBUTED AND WILL CONTINUE TO CONTRIBUTE, A GREAT DEAL TO EVERYONE. THEIR PRESENCE CUTS DOWN OR PREVENTS SOIL EROSION, THUS PRESERVING A VALUABLE RESOURCE. THEY PROVIDE NATURAL SETTINGS FOR RECREATIONAL ACTIVITIES SUCH AS HIKING AND CAMPING, AND THEY ARE VERY IMPORTANT ELEMENTS OF THE WATERSHED.

OVER 85% OF THE FORESTED LAND IN CONNECTICUT IS OWNED BY PRIVATE INDIVIDUALS. THEY DERIVE AN ECONOMIC INCENTIVE FOR KEEPING THE FORESTS. MODERN METHODS OF FOREST MANAGEMENT MAY MAKE IT POSSIBLE TO OBTAIN LUMBER FROM THEM WHILE STILL MAINTAINING THEM VIRTUALLY INTACT. AS REVEALED IN A 1974 STUDY BY NEW ENGLAND RESEARCH, INC., THESE OWNERS NOT ONLY ENJOY INCOME FROM THEIR WOODLOTS, BUT ALSO ENJOY RECREATIONAL ACTIVITIES SUCH AS HIKING, HUNTING AND CAMPING IN THEM.

AN IMPORTANT VALUE OF A FOREST STEMS FROM THE FACT THAT IT IS A STABLE AND SELF PRESERVING ENVIRONMENT. IF LEFT ALONE THE FOREST WILL REMAIN ESSENTIALLY THE SAME FOR HUNDREDS PERHAPS THOUSANDS OF YEARS. FORESTS ARE STABLE BECAUSE THEY HAVE A GREAT VARIETY OF PLANT AND ANIMAL LIFE. THIS ALSO IS ONE REASON WHY THEY ARE AESTHETICALLY PLEASING. MAKE A NOTE TO YOURSELF THAT YOU ARE GOING TO TAKE ANOTHER LOOK AT THAT NEIGHBORHOOD WOODLOT YOU HAVE PASSED BY SO MANY TIMES. YOU MAY BE SUPRISED TO DISCOVER JUST HOW COMPLEX A WOODLOT OR A FOREST ACTUALLY IS.

YOU MAY GAIN AN APPRECIATION OF THE STRUCTURE AND COMPLEXITY OF A FOREST BY FIRST LOOKING AT THE SLIDE # 7 OF THE INTERIOR OF A FOREST. DO YOU NOTICE ANY DISTINCTIVE HORIZONTAL LAYERS IN THE FOREST? HOW MANY DO YOU SEE? LOOK AT GUIDE SHEET # 4. DID YOU FIND THE FOUR DISTINCT REGIONS OR LAYERS THAT ARE ILLUSTRATED ON GUIDE SHEET # 4? A LAYER CONSISTS OF TREES WHICH FORM THE ROOF OR CANOPY OF THE FOREST. BELOW THE CANOPY IS A SECOND LAYER OF SMALLER TREES (LAYER B) WHICH FORMS AN UNDERSTORY. CLOSER TO THE GROUND IS LAYER C, WHICH IS COMPOSED OF SMALL TREES AND SHRUBS, SUCH AS OUR STATE FLOWER, THE MOUNTAIN LAUREL. LAYER D CONSISTS OF THE HERBS AND FERNS OF THE FOREST FLOOR. EACH OF THESE DIFFERENT LAYERS OF VEGETATION PROVIDES A WIDE VARIETY OF HIDING AND FEEDING PLACES FOR ANIMALS. WARBLERS, ORIOLES AND SQUIRRELS MAY NEST AND FEED HIGH IN THE CANOPY OR TREE TOP LAYERS OF VEGETATION. FURTHER BELOW IN THE UNDERSTORY OR TALL SHRUB LAYER, WE MAY FIND ROBINS AND TANAGERS. CHIPMUNKS AND A VARIETY OF MICE MAY BE FOUND FEEDING AND HIDING IN THE VEGETATION COMPRISING THE FOREST FLOOR.

slide #7

G.S. #5

ECOLOGISTS USE THE TERM DIVERSITY TO INDICATE THE VARIETY OF PLANT AND ANIMAL LIFE. DIVERSITY REFERS TO THE NUMBER OF DIFFERENT KINDS OF PLANTS AND ANIMALS TO BE FOUND. FOR EXAMPLE, COMPARE THE HARD WOOD FOREST COMMUNITY IN SLIDE # 7 WITH A PLANTED AND MANAGED CORNFIELD IN SLIDE # 8. (PAUSE) ARE YOU IMPRESSED WITH THE GREAT VARIETY OF VEGETATION TO BE FOUND IN THE FOREST AS COMPARED TO THE CORNFIELD. IN ANALYZING THE DIVERSE VEGETATION WE FIND SOME TREES TO BE COMMON, OTHERS TO BE ABUNDANT AND A FEW TO BE RARE. THE DIVERSITY OF THE FOREST NOT ONLY IS AESTHETICALLY PLEASING TO US BUT ALSO MAKES IT A MORE STABLE COMMUNITY. THE DIVERSITY OF THE FORESTS PROMOTES STABILITY BY SPREADING THE RISK OF NATURAL DISASTER AMONG ALL OF THE SPECIES OF TREES. THUS IF A DISEASE APPEARS AND DESTROYS ONE PARTICULAR SPECIES, OTHER SPECIES TAKE OVER AND MAINTAIN THE FOREST.

slide #8

AN EXCELLENT CASE STUDY IN THE NORTHEAST INVOLVES THE CHESTNUT TREES . . . ORIGINALLY THE AMERICAN CHESTNUT WAS AN IMPORTANT MEMBER OF THE CONNECTICUT FORESTS. IN 1904, A CHESTNUT FUNGUS WAS ACCIDENTALLY INTRODUCED INTO THE UNITED STATES FROM CHINA. THE AMERICAN CHESTNUT PROVED TO BE SUSCEPTABLE TO THE NEW FUNGUS AND THE CHESTNUT TREES QUICKLY DIED. BY 1952 ALL LARGE CHESTNUT TREES IN THE U.S. HAD BEEN KILLED. YET, THE APPEARANCE OF THE FOREST REMAINED ESSENTIALLY THE SAME. OTHER TREES HAD SIMPLY TAKEN OVER THE PLACE OF THE ONCE PREDOMINANT CHESTNUT.

CONTRAST THE STABILITY OF A FOREST COMPARED TO THAT OF LAND DEVOTED TO FARMING, ONE TYPE OF PLANT COVERS LARGE EXPANSES OF LAND. A SYSTEM IN WHICH A LARGE LAND AREA IS COVERED BY A SINGLE TYPE OF VEGETATION IS CALLED A MONOCULTURE. AS YOU HAVE PROBABLY GUESSED, A MONOCULTURE IS MUCH LESS STABLE THAN A FOREST. A GOOD EXAMPLE OF THE POTENTIAL INSTABILITY OF A MONOCULTURE SUCH AS CORN, OCCURRED IN 1970. IN THAT YEAR A NEW STRAIN OF DISEASE CALLED CORN LEAF BLIGHT SUDDENLY APPEARED. IT SPREAD RAPIDLY FROM ONE CORN FIELD TO ANOTHER IN THE MIDWEST BECAUSE MOST OF THE VEGETATION IN ADJACENT

FIELDS WAS OF THE SAME SUSCEPTIBLE VARIETY. THE NEW DISEASE WAS LIGHTLY LETHAL AND CAUSED A 12% LOSS OF THE CORN CROP FOR THAT YEAR. A MONOCULTURED SYSTEM IS FAR LESS ABLE TO SURVIVE NATURE OR MAN CAUSED DISASTERS THAN IS A DIVERSE ECOSYSTEM.

DIVERSITY THUS PROVIDES GREATER INSURANCE AGAINST RISK OF LOSS OF THE FOREST THROUGH THE RESULT OF A NATURAL CATASTROPHE. FINALLY THE DIVERSITY OF THE FOREST VEGETATION PROVIDES MANY SUITABLE NICHES OR SMALL HABITATS FOR A GREAT VARIETY OF ANIMALS, THEREBY ENSURING A DIVERSITY OF ANIMAL LIFE. AGAIN, HARMONY AND STABILITY ARE PROMOTED, AND WE ARE PROVIDED WITH AN AESTHETICALLY PLEASING ENVIRONMENT. THE DIVERSIFIED FOREST COMMUNITY MAKES FULLER USE OF THE SUN'S ENERGY BECAUSE ALL OF THE AVAILABLE HABITATS ARE FILLED, THEREBY INCREASING THE PRODUCTION OF SUCH FOREST PRODUCTS AS LUMBER.

FINALLY, WE SHOULD NOTE THAT MAN SEEMS TO REQUIRE DIVERSITY SUCH AS THAT PROVIDED IN FORESTS FOR HIS MENTAL ENJOYMENT. INDEED, MAN ALMOST ALWAYS, WHEN GIVEN THE CHOICE, OPTS FOR DIVERSITY, AND SOCIO-BEHAVIORIAL STUDIES SUGGESTING THAT NATURAL DIVERSITY SEEMS TO BE A NECESSARY REQUIREMENT FOR OUR OPTIMUM HEALTH AND WELL BEING.

BECAUSE A FOREST OR WOODLOT TENDS TO BE A STABLE ENVIRONMENT, IT REQUIRES LITTLE OR NO MONETARY INPUT FOR CONTINUED MAINTENANCE AND PRESERVATION.

IF DISTURBED, FORESTS HAVE THE ABILITY TO REPAIR AND REGENERATE THEMSELVES THROUGH A PROGRESSIVE SERIES OF STAGES. THIS REGENERATIVE PROCESS IS CALLED SUCCESSION.

ON GUIDE SHEET # 5 YOU WILL FIND A SIMPLIFIED OUTLINE OF THE MAJOR STEPS IN THE PROCESS OF SUCCESSION. REFER TO GUIDE SHEET # 5 WHILE THE TAPE RECORDER KEEPS PLAYING.

G.S. #5

IT IS IMPORTANT TO NOTE THAT ALL FORMS OF MODIFIED LAND, WHETHER IT BE CROPLAND, PASTURE, A BURNED OVER FOREST OR EVEN A SANITARY LANDFILL SITE WILL WHEN ABANDONED, GO THROUGH THE ORDERLY PROCESS OF SUCCESSION AND EVENTUALLY REACH A RELATIVELY STABLE CLIMAX STATE. IN THE UPLAND AREAS OF THE NORTHEAST, FORESTS REPRESENT THE CLIMAX STAGE OF THE PROCESS OF SUCCESSION. DURING THE DEPRESSION OF THE 1930'S MANY FARMS IN THE NORTHEASTERN STATES WERE ABANDONED. THE CROP AND PASTURE LAND FIRST BECAME WEED COVERED FIELDS. THE WEEDS IN TURN WERE REPLACED BY SCATTERED CEDARS, THEN BY BIRCH AND RED MAPLE, UNTIL THE FORESTS ONCE AGAIN STOOD WHERE THEY WERE BEFORE THE LAND WAS FIRST CLEARED FOR FARMING.

ANOTHER DEMONSTRATION OF THE PROCESS OF SUCCESSION CAN BE OBSERVED WHEN A FOREST IS BURNED OVER OR PERHAPS CUT AWAY, LEAVING BEHIND BARE GROUND. THE BARE EARTH FORMED AN INVITING HABITAT FOR SOME TYPES OF PLANTS SUCH AS CRABGRASS WHICH RAPIDLY INVADES THE OPEN AREA. WITHIN A YEAR THE BARE FIELD WILL BE TRANSFORMED INTO A SIMPLE COMMUNITY OF CRABGRASS. THE CRABGRASS COMMUNITY IN TURN FORMS AN INVITING HABITAT FOR SMALL ANIMALS, AND A VARIETY OF SPIDERS, ANTS AND GRASSHOPPERS TAKE UP RESIDENCE IN THE CRABGRASS FIELD. THESE PIONEERS, AS THE INITIAL PLANTS AND ANIMAL INVADERS ARE TERMED, SOON CHANGE THE NATURE OF THE COMMUNITY. THROUGH THEIR LIFE ACTIVITIES THEY ESTABLISH A BETTER SOIL BASE AND STABILIZE THE ENVIRONMENT OF THE CRABGRASS COMMUNITY. THIS STABILI-

ZATION SOON ALLOWS THE INVASION OF OTHER PLANTS WHICH TRANSFORMS THE CRABGRASS COMMUNITY INTO A FIELD OF WEEDS SUCH AS HOUSEWEED, MILKWEED, ASTERS AND GOLDENROD AS IS SHOWN IN SLIDE # 9. THE NEW PLANTS ALLOW MORE ANIMALS TO COLONIZE THE AREA, AND A VARIETY OF BUTTERFLIES, AND OTHER INSECTS MAKE THEIR APPEARANCE. AGAIN THE PROCESS OF ENVIRONMENTAL ALTERATION BY THE PLANTS AND ANIMALS OCCURS, AND WITHIN ABOUT SIX YEARS THE WEED STREWN FIELD BECOMES A GRASSLAND. NOW THE PROCESS OF CHANGE ACCELERATES. THE GRASS ROOTS PENETRATE DEEPLY INTO THE EARTH, AIDING IN SOIL FORMATION. IN ADDITION, THE GRASSES PRODUCE AND ACCUMULATE A GOOD DEAL OF ORGANIC MATTER. THIS NEW TRANSFORMATION ALLOWS SHRUBS TO INVADE THE AREA AS SHOWN IN SLIDE # 10. WE FIND CEDAR, ALDER AND BARBERRY CROWDING OUT THE GRASSES. IN SLIDE #10 THE CEDAR TREES RANGE IN AGE FROM ABOUT 3 TO 10 YEARS OF AGE. REMNENTS OF THE PREVIOUS GRASSLAND STAGE MAY BE SEEN IN THE AREAS BETWEEN THE CEDARS.

slide #9

slide #10

THE CEDAR AND SHRUB FIELD ENCOURAGES THE ENTRY OF MORE ANIMALS, PARTICULARLY BIRDS SUCH AS FIELD SPARROWS AND BLUEBIRDS. THE BIRDS FIND THE SHRUBS TO BE GOOD NESTING PLACES AND THE INTERVENING PATCHES OF FIELD ARE GOOD AREAS TO SEARCH FOR FOOD. WITHIN A FEW YEARS CONIFERS BECOME THE DOMINANT SHRUB FORM, AND AS THEY GROW TO MATURITY, THE SHRUB COMMUNITY IS TRANSFORMED INTO A PINE FOREST WHICH MAY PERSIST FOR THIRTY OR FORTY YEARS. EVENTUALLY SEEDLINGS OF OAK, MAPLE AND HICKORY BECOME ESTABLISHED ON THE FOREST FLOOR. AS THEY MATURE, THEY DISPLACE THE PINE TREES AND EVENTUALLY A CLIMAX FOREST OR HARDWOOD TREES IS ESTABLISHED. NOW A GREAT MANY SPECIES OF ANIMALS WILL BE ABLE TO FIND SUITABLE HABITATS AND INVADE THE FOREST. FINALLY, THE BURNED OUT AREA HAS BECOME A COMPLEX AND DIVERSIFIED ECOLOGICAL COMMUNITY. BECAUSE THE FOREST IS THE FINAL AND PERMANENT COMMUNITY IT IS CALLED THE CLIMAX HARDWOOD COMMUNITY. ECOLOGICAL SUCCESSION, WHICH, FROM START TO FINISH TOOK PERHAPS 100 YEARS IS NOW FINISHED.

A STYLIZED DIAGRAM ILLUSTRATING THE TIME SCALE OF SUCCESSION IS PRESENT IN GUIDE SHEET # 5. THE STYLIZED DIAGRAM SHOWS A TYPICAL FOREST SUCCESSION PATTERN FOUND IN THIS AREA. STOP THE RECORDER, WHILE YOU STUDY GUIDE SHEET # 5.

G.S. #5

THE REGENERATIVE CAPACITY OF FOREST SHOULD NOT LULL US INTO A FALSE SENSE OF SECURITY. UNFORTUNATELY, THE 100 YEARS IT TAKES FOR NATURE TO REPRODUCE A FOREST IS IN FACT A LONG TIME, AND THE AREA MAY BE ESSENTIALLY AN UNUSUAL WASTELAND FOR THAT PERIOD. WE SHOULD CAREFULLY MAINTAIN OUR FORESTS, RATHER THAN DEPEND ON NATURE TO CORRECT OUR MISTAKES!

FORESTS PLAY AN IMPORTANT ROLE IN THE WATER SUPPLY SYSTEM OF MANY COMMUNITIES. AS A RESULT, WATER COMPANIES MAINTAIN FORESTS FOR ECONOMIC REASONS. THE BUSINESS OF WATER COMPANIES IS TO COLLECT, TREAT AND SELL WATER. IN MANY COMMUNITIES, WATER IS COLLECTED FROM WATERSHEDS. A WATERSHED IS THE LAND FROM WHICH WATER DRAINS INTO A RIVER, LAKE OR RESERVOIR. THE CLEANER THE WATER COLLECTED, THE LESS TREATMENT IS REQUIRED AND THE

CHEAPER THE FINAL COST. A WATERSHED COVERED BY FORESTS YIELDS MUCH MORE CLEAN WATER THAN DOES BARE LAND. THE IMPORTANCE OF FOREST COVER ON WATERSHEDS HAS BEEN WELL DOCUMENTED BY A SERIES OF INVESTIGATIONS CONDUCTED BY YALE AND CORNELL FORESTRY SCIENTISTS AT HUBBARD BROOK FOREST IN NEW HAMPSHIRE.

HUBBARD BROOK EXPERIMENTAL FOREST PROVIDED ECOLOGISTS, DR. HERBERT BORMANN, DR. GENE LIKENS, AND THEIR COLLEAGUES, A VALUABLE OPPORTUNITY TO STUDY AND INTERPRET THE FUNCTION OF THE FOREST ECOSYSTEM. FOR SEVERAL YEARS, THEY STUDIED TWO ADJACENT WATERSHEDS AT HUBBARD BROOK FOREST. THEY COLLECTED DATA ON WATER FLOW, SOIL EROSION, MINERAL LOSS AND MANY OTHER VARIABLES. IN 1966, THE FIRST MAJOR EXPERIMENT WAS CONDUCTED - EVERY SINGLE PLANT AND TREE ON WATERSHED 2 A 30 ACRE PLOT WAS CUT DOWN! THE ADJACENT WATERSHED 1, WAS LEFT UNDISTURBED.

AS A RESULT OF THE DENUING OF THE FOREST, RESEARCHERS FOUND THAT THE QUANTITY AND QUALITY OF THE WATER COLLECTED FROM THIS AREA OF THE WATERSHED HAD CHANGED DRAMATICALLY. GUIDESHEET # 6 PRESENTS SOME OF THEIR RESULTS.

G.S. #6

ON GUIDE SHEET # 6 PART A THE RESULTS OF THE EXPERIMENT ARE PRESENTED GRAPHICALLY. THE SOLID LINE REPRESENTS CONDITIONS IN THE UNCUT FOREST, WATERSHED 1. THE DOTTED LINE REPRESENTS THE CLEAR CUT OR DENUED WATERSHED 2. AS YOU CAN SEE, THE LEVEL OF WATER, SOIL AND MINERAL LOSS IS LOWER IN THE FORESTED AREA THAN THE CLEARCUT AREA. PART B OF GUIDE SHEET # 6 HAS A PARTIAL LISTING OF THE DISSOLVED SOLIDS LOSS FOR BOTH WATERSHEDS, DURING TWO, TWO YEAR STUDY PERIODS. TURN OFF THE RECORDER IF YOU WOULD LIKE TO HAVE MORE TIME TO STUDY GUIDE SHEET # 6.

GUIDE SHEET # 6 SUGGESTS TWO WAYS IN WHICH FORESTS HELP ALLEVIATE WATER POLLUTION - BY RETENTION OF SOIL AND MINERALS. LOSS OF SOIL IN CUT OVER AREAS MAKES WATER CLOUDY AND MURKY. IF FORESTS ARE LEFT UNDISTURBED VERY LITTLE SOIL ERODES INTO NEIGHBORING WATERWAYS. LOSS OF DISSOLVED SOLIDS FROM WATERSHEDS IS GREATLY HASTENED BY CLEARCUTTING AS POINTED OUT DRAMATICALLY IN GUIDE SHEET # 6B. IN FACT, SOME DISSOLVED MATERIALS SUCH AS NITRATES, ARE LOST AT THE RATE OF 30 AND 40 TIMES FASTER FROM AREAS WHERE THE FORESTS HAVE BEEN REMOVED. MINERALS SUCH AS NITROGEN AND PHOSPHOROUS, ARTIFICIALLY ENRICH WATERS AND MAY LEAD TO THE DESTRUCTION OF ORGANISMS IN DOWNSTREAM RIVERS AND LAKES.

THE LIVING ORGANISMS OF FORESTS CLEAN WATER THROUGH THEIR TRAPPING OR ABSORPTION OF POLLUTANTS. THIS PHENOMENON OCCURS BECAUSE FOREST VEGETATION ABSORBS AND PROCESSES WATER AT AN ASTOUNDING RATE. FOR EXAMPLE, A SINGLE TREE MAY PROCESS 80 GALLONS OF WATER IN ONE DAY. THE POLLUTANTS IN THE WATER ABSORBED BY THE TREE ARE REMOVED AND STORED IN WOODY PLANT TISSUE.

IT'S EASY TO SEE WHY WATER COMPANIES WANT FOREST ON THEIR WATERSHED. THE VEGETATION OF THE FOREST AIDS IN RETAINING AND CLEANSING WATER IN AN AREA. REMOVE THE VEGETATION AND THE WATER HOLDING CAPABILITY OF THE LAND DROPS DRASTICALLY. FOR EVERY CUBIC FOOT OF WATER THAT FALLS ON A FOREST ECOSYSTEM ABOUT 80% IS ABSORBED AND RETAINED,

CHIEFLY BY THE FOREST VEGETATION AND ITS HUMUS SOIL BASE. THE REMAINING 20% PERCOLATES DOWNWARD THROUGH THE SOIL AND EVENTUALLY ENTERS THE WATER TABLE. FOR THIS REASON, INTACT, FORESTED WATERSHEDS ARE IMPORTANT FOR FLOOD CONTROL. THROUGH THEIR ABILITY TO SLOW AND STORE WATER, THEY HELP TO REDUCE DAMAGE FROM FLOODS. IN CONTRAST, UPLAND AREAS FROM WHICH THE VEGETATION COVER HAS BEEN REDUCED OR ELIMINATED DO NOT HOLD WATER EFFECTIVELY. WATER LOSS FROM SUCH AREAS IS VERY HIGH AND INCREASES THE LIKELIHOOD OF FLOODS. THE CATASTROPHIC FLOODS WHICH OCCURRED OVER PORTIONS OF THE EASTERN UNITED STATES IN JUNE OF 1973 WERE DUE IN PART TO THE REDUCED WATER HOLDING CAPABILITY OF UPLAND AREAS WHICH HAD BEEN CLEAR CUT FOR TIMBER, OR TO MAKE WAY FOR SHOPPING CENTERS, INDUSTRIAL PARKS OR SUBURBAN HOUSING.

FOREST OR WOODLOTS CAN ALSO HELP COMBAT NOISE POLLUTION. AS SHOWN IN GUIDE SHEET #7B, TREES ALONGSIDE ROADWAYS, RAILROAD RIGHTS OF WAY AND THE BORDERS OF AIRPORTS ACT AS ACOUSTIC BARRIERS, WHICH HELP ABSORB AND MUFFLE THE SOUNDS OF PASSING VEHICLES. THEY MAY ALSO DEFLECT THE SOUND UPWARDS. IN THE EXAMPLE ON GUIDE SHEET #7B THE ROAD WOODLOT REDUCES THE NOISE POLLUTION FROM A HIGH OF ABOUT 85 DECIBELS; THE EXPECTED NOISE LEVEL OF TRAFFIC AT ROADSIDE, DOWN TO ONLY 5-10 DECIBELS. THIS REPRESENTS A SIGNIFICANT LESSENING OF THE NOISE TRANSMITTED INTO AREAS ADJACENT TO ROADWAYS. WOODLOTS AROUND AIRPORTS AND ALONG MAJOR HIGHWAYS PROVIDE IMPORTANT NOISE SHIELDING MECHANISMS.

G.S. #7B

TREES ALSO CLEANSE AIR AS THEY PROCESS IT AS PART OF THEIR METABOLIC PROCESSES AS shown in guide sheet #7A.

CONSIDER THIS, A FOREST OF TREES 15 FEET TALL WILL FILTER POLLUTED AIR CONTAINING 150 PARTS PER BILLION OF OZONE, A HEALTH HAZARD, SO THAT AIR REACHING THE GROUND ONLY CONTAINS A CONCENTRATION OF 30 PARTS PER BILLION. ^{One 40 square meter block of vegetation will provide the oxygen required by one man or woman.} MOREOVER, ONE ACRE OF VEGETATION WILL TRAP THE OZONE FROM EIGHT AUTOMOBILES OR THE CARBON DIOXIDE FROM FIFTY. HOWEVER, TREES ALONE DON'T PROVIDE THE ANSWER TO OUR NATIONAL AIR POLLUTION PROBLEM BECAUSE THEY TOO, MAY BE DAMAGED BY HIGH LEVELS OF POLLUTION. Plant damage caused by air pollution can be seen in slide # 11.

G.S. #7A

Slide #11

FINALLY, LET US CONSIDER THE ECONOMIC BENEFITS DERIVED FROM THE SELECTIVE HARVESTING OF CONNECTICUT'S FORESTS. WOODLANDS REPRESENT A RENEWABLE RESOURCE WHICH, WHEN PROPERLY MANAGED AND HARVESTED PROVIDE LUMBER FOR A VARIETY OF PURPOSES. SOFTWOODS, SUCH AS PINES AND HEMLOCKS, FOR EXAMPLE, ARE USED FOR HOUSING CONSTRUCTION. CEDARS ARE USED FOR POLES AND POSTS. OAKS AND MAPLES AND BIRCHES ARE USED FOR FURNITURE CONSTRUCTION. A VARIETY OF TREES MAY ALSO BE USED FOR FIREWOOD AND FOR PULP AND PAPER MANUFACTURE. THUS TIMBER HARVESTING STIMULATES A DIVERSITY OF INDUSTRIES AND PROVIDES EMPLOYMENT FOR THE CONNECTICUT LABOR FORCE. UNFORTUNATELY, ONLY ABOUT ONE-FIFTH OF THE ANNUAL TIMBER GROWTH IS ACTUALLY HARVESTED. THE REMAINDER DIES AND ROTS. THIS IS ACTUALLY A WASTE OF A VALUABLE RESOURCE AND EFFORTS NEED TO BE MADE TO EDUCATE FOREST OWNERS TO EFFECTIVELY MANAGE THEIR WOODLOT AND FOREST HOLDINGS

OF COURSE YOU AS A MEMBER OF YOUR COMMUNITY DERIVE BENEFIT FROM CLEAN AIR AND

WATER AND A MEASURE OF QUIET WHICH FORESTS PROVIDE. BUT YOU ALSO PROBABLY ENJOY THEM EQUALLY AS MUCH BECAUSE THEY ARE PLEASING TO LOOK AT AND PROVIDE OPPORTUNITIES FOR A VARIETY OF RECREATIONAL ACTIVITIES SUCH AS BIKING, HUNTING, AND CAMPING.

NOW LET US TURN OUR ATTENTION TO FARMS AS A PART OF THE UPLANDS. HOW WELL DO YOU KNOW THE PRODUCTS OF CONNECTICUT AGRICULTURE? ON GUIDE SHEET # 8, WE HAVE LISTED PRODUCT CATEGORIES OF AGRICULTURAL GOODS PRODUCED IN CONNECTICUT. TURN OFF THE RECORDER AND TRY TO NAME SEVERAL FARM PRODUCTS IN EACH CATEGORY. (PAUSE)

G.S. #8

WELCOME BACK! DID THE VARIETY OF FARM PRODUCTS SUPRISE YOU? IT IS APPARENT THAT CONNECTICUT'S FARMERS PRODUCE A LARGE VARIETY OF CROPS AND MOST OF THESE CROPS ARE PERISHABLE GOODS. ON GUIDE SHEET #9 YOU WILL FIND A PARTIAL LISTING OF THE DIFFERENT CROPS AND ANIMALS GROWN BY CONNECTICUT FARMERS. WOULD YOU HAVE GUESSED THAT ALL OF THESE AGRICULTURAL PRODUCTS WERE GROWN IN OUR STATE?

G.S. #9

ALTHOUGH FARMING IS AN INTEGRAL PART OF CONNECTICUTS CULTURAL HERITAGE, THE THIN, ROCKY SOILS AND HILLY TERRAIN HANDICAP LOCAL FARMERS WHO HAVE TO COMPETE WITH THE MORE FERTILE FARMS OF THE MIDWEST. CONSEQUENTLY, THE CONNECTICUT FARMS WHICH SURVIVE TODAY ARE THOSE WHICH PRODUCE PERISHABLE CROPS FOR LOCAL MARKETS. In slide # 12, you see a local farm stand selling Connecticut produce. Farm land still occupies ABOUT 18% OF THE STATE'S LAND AREA, AND SALE OF FARM CROPS PRODUCES AN ADEQUATE INCOME, IN FACT, CONNECTICUT FARMS OUT PRODUCE ALL OTHER NEW ENGLAND STATES ON A PER ACRE BASIS. IN 1972, CONNECTICUT'S TOTAL CASH INCOME FOR CROPS, LIVESTOCK AND POULTRY PRODUCTS WAS OVER \$160 MILLION DOLLARS. ON GUIDE SHEET # 10 PART A, THE DISTRIBUTION AND APPROXIMATE ACREAGE OF CONNECTICUT FARMS IS SHOWN. AS YOU LOOK AT GUIDE SHEET # 10, NOTE THAT THE LARGEST AMOUNT OF FARMLAND IS LOCATED IN THE EASTERN AND WESTERN UPLANDS OF THE STATE. (PAUSE) THE CIRCLES INDICATING THE RELATIVE ACREAGE PER COUNTY ARE SUBDIVIDED INTO WOODLAND, CROPLAND AND PASTURE LAND PORTION. YOU MAY WANT TO STOP THE RECORDER WILL YOU STUDY THIS CHART OF AGRICULTURAL LAND USE. (PAUSE)

Slide #12

G.S. #10

NOW LOOK AT PART B OF GUIDE SHEET # 10. THIS PART OF THE GUIDE SHEET CONTAINS INFORMATION ON THE VALUE OF FARM SALES. NOTE THAT THE CIRCLES ARE SUBDIVIDED THIS TIME. THE SECTIONS OF THE CIRCLE INDICATE THE RELATIVE PROPORTION OF LIVESTOCK AND LIVESTOCK RELATED SALES AND CROP SALES.

DO YOU SEE ANY RELATIONSHIP BETWEEN THE RELATIVE AMOUNTS OF LAND USED IN PART A AND THE LIVESTOCK VERSUS CROP SALES ON PART B OF GUIDE SHEET # 10? (Pause) Now look at slide #13.

Slide #13

THE EASTERN AND WESTERN UPLAND FARMS ARE MOST HEAVILY INVOLVED IN LIVESTOCK OPERATIONS. MUCH OF THEIR LAND MUST BE USED FOR FEEDING AND PASTURE OF THEIR LIVESTOCK. MORE INFORMATION ON THIS ISSUE CAN BE OBTAINED FROM THE DETAILED BREAKDOWN OF FARM PRODUCT SALES PRESENTED IN GUIDE SHEET # 12. ONCE AGAIN, WE CAN SEE THAT SALES OF LIVESTOCK AND DAIRY PRODUCTS ARE GREATEST IN THE EASTERN AND WESTERN UPLANDS WHILE SALES OF VEGETABLES AND FRUITS ARE GREATER IN THE CENTRAL LOWLANDS. THE VARIETY OF VEGETABLES, FRUITS AND BERRIES GROWN REFLECT THE NATURE OF MUCH OF CONNECTICUT'S FARMING INDUSTRY, WHICH, AS PREVIOUSLY NOTED, PRODUCE PERISHABLE CROPS

G.S. #12

FOR LOCAL MARKET. YOU MAY BE INTERESTED TO KNOW THAT CONNECTICUT'S ONLY MAJOR EXPORT CROP IS TOBACCO, WHICH IS GROWN IN NEW HAVEN AND HARTFORD COUNTIES. ON GUIDE SHEET # 11 PART A THERE IS A TABLE SUMMARIZING CONNECTICUT'S AGRICULTURAL PRODUCTION AS A PERCENTAGE OF CONNECTICUT'S CONSUMPTION. CONNECTICUT'S FARMS PRODUCED 20% OF THE DAILY PROTEIN NEEDS OF THE STATE'S POPULATION. BECAUSE MUCH OF CONNECTICUT'S FOOD IS GROWN CLOSE TO THE MARKET, THE FOOD IS RELATIVELY INEXPENSIVE, AND FRESH. IN ADDITION TO THE IMPORTANCE OF FRESH, LOCALLY PRODUCED CROPS, ANOTHER VALUE OF PRODUCING FOOD WITHIN A LOCAL MARKET REGION IS THAT AGRIBUSINESS CAN BE ENERGY EFFICIENT. SINCE THE FARM IS CLOSE TO THE MARKET, LESS ENERGY IS REQUIRED TO BRING THE LOCAL PRODUCTS TO MARKET THAN IMPORTED PRODUCTS. ALSO FOOD DELIVERY IS LESS VULNERABLE TO NATIONWIDE ENERGY SHORTAGES, TRANSPORTATION STRIKES AND GENERAL SPOILAGE.

THE ECONOMIC VALUE OF FARMS IS MANIFESTED IN JOBS ON THE FARM, IN SUPPORT INDUSTRIES AND IN SERVICE INDUSTRIES. FARM LAND IS ALSO TAXABLE LAND AND PROVIDES INCOME TO TOWN GOVERNMENTS.

PERHAPS, THE MOST IMPORTANT NON-FOOD PRODUCING SERVICE PROVIDED BY FARMS IS THE MAINTENANCE OF THE HYDROLOGICAL CYCLE, WHICH PROVIDES US WITH WATER WE NEED FOR HUMAN ACTIVITY. THE CONNECTICUT PLAN FOR CONSERVATION AND DEVELOPMENT INDICATES THAT THE AVAILABILITY OF FRESH WATER TENDS TO BE A LIMITING FACTOR ON MAN'S ACTIVITIES. FARMS, EITHER IN WOODLOT PASTURE OR UNDER CULTIVATION HELP MAINTAIN LOCAL WATER SUPPLIES BY ABSORBING PRECIPITATION AND TRANSFERRING IT TO THE GROUND WATER SYSTEM, AND TO BROOKS, PONDS, AND LAKES. OFTEN LARGE PORTIONS OF A WATERSHED ARE COMPOSED OF AGRICULTURAL ACREAGE. THE LOSS OF THESE AGRICULTURAL LANDS TO HIGH DENSITY USE COULD ADVERSELY AFFECT THE ENTIRE HYDROLOGIC SYSTEM AND ENDANGER THE WATER SUPPLY FOR COMMUNITIES IN THE REGION.

AGRICULTURAL LAND PROVIDES OTHER, GENERALLY OVERLOOKED BENEFITS. AGRICULTURAL LAND CAN FUNCTION AS A POLLUTION TREATMENT SYSTEM. THIS ABILITY CAN BE EXPECTED TO INCREASE IN IMPORTANCE AS THE POPULATION INCREASES. THE POLLUTION TREATMENT FUNCTIONS CAN BE CATEGORIZED INTO FOUR AREAS. AS MORE AND MORE SEWAGE TREATMENT PLANTS ARE BUILT TO MEET THE NEEDS OF A GROWING POPULATION, THE DISPOSAL OF NUTRIENT LADEN SLUDGE WILL BECOME A MAJOR PROBLEM. ONE ALTERNATIVE WAY OF DISPOSING OF SLUDGE IS TO TRUCK IT TO FARMS WHERE IT CAN BE USED AS FERTILIZER. THIS PROCEDURE WOULD REDUCE THE NEED FOR EXPENSIVE INORGANIC FERTILIZERS WHILE SOLVING A MAJOR SOLID WASTE PROBLEM.

TERTIARY SEWAGE TREATMENT TO REMOVE PHOSPHATES, NITRATES, AND OTHER NUTRIENTS IS EXPENSIVE. BUT PURIFICATION BY FILTRATION THROUGH A SOIL CROP FILTER REMOVES NUTRIENTS CHEAPLY, GROWS A USEFUL CROP, AND RECHARGES GROUND WATER SUPPLIES. SEVERAL TOWNS ARE CONSIDERING UTILIZING ADJACENT FARMS TO FILTER THEIR SEWAGE EFFLUENT. EXPERIMENTS TO DATE INDICATE THAT THE SYSTEM IS VERY WORKABLE.

SIMILAR TO FORESTS, AGRICULTURAL LANDS TRAP AIR POLLUTANTS SUCH AS OZONE AND SULFUR

DIOXIDE. VEGETATION IS ALSO AN EFFECTIVE FILTER FOR PARTICULATE MATTER.

ANOTHER AREA IN WHICH AGRICULTURAL LAND HAS A BENEFICIAL EFFECT INVOLVES AGRICULTURAL LAND AS OPEN SPACE. OPEN SPACE WOODLOTS AND CROPS IN GENERAL, REDUCE NOISE POLLUTION BY ACTING AS BUFFER ZONES.

FARMS ARE ALSO A VALUED AND AESTHETICALLY PLEASING PART OF THE NEW ENGLAND COUNTRYSIDE. BECAUSE FARMS ARE FREQUENTLY LOCATED ON THE EDGE OF URBAN SPRAWL, MANY OF THEM FORM A BUFFER ZONE BETWEEN THE CITY AND THE COUNTRYSIDE. IN THIS CAPACITY THEY PROVIDE A WELCOME SCENIC RELIEF WHICH HELPS ALLEVIATE THE URBAN LANDSCAPE SCENE.

IN ADDITION TO THE VALUES DISCUSSED ALREADY, AGRICULTURAL LAND HAS VALUE AS OPEN SPACE, AS RECREATION LAND, AS A CONTRIBUTION TO OUR AESTHETIC AND SCENIC EXPERIENCE AND FOR ITS PART IN PRESERVING OUR HISTORICAL AND CULTURAL HERITAGE. IN OTHER WORDS,

FARMS ARE AN INTEGRAL PART OF THE NATURAL RESOURCE WE KNOW AS CONNECTICUT COUNTRYSIDE.

Now look at slide # 14. (Pause) Here in slide #14 you can see an area where housing developments have been built on agricultural land. In the top of the slide, a small area of farm land still remains. Unfortunately for all their value, agricultural lands are disappearing rapidly. The charts on GUIDE SHEET # 11 PART B DOCUMENT THE LOSS OF FARM ACREAGE IN THREE NORTHEASTERN STATES.

Slide #14

G.S. #11

BETWEEN 1949 AND 1971 - TWENTY-TWO YEARS, CONNECTICUT AND MASSACHUSETTS HAVE LOST 62% OF THEIR FARM ACREAGE. APPROXIMATELY 1 MILLION ACRES PER STATE, PART C AND D OF GUIDE SHEET # 11, DOCUMENTS THE DECREASE IN NUMBER OF FARMS IN THREE SELECTED NEW ENGLAND STATES. TURN THE RECORDER OFF WHILE YOU STUDY GUIDE SHEET # 11. (PAUSE)

ALTHOUGH MANY OF CONNECTICUT'S FARMS ARE ECONOMICALLY SUCCESSFUL, THERE ARE MANY PROBLEMS AND PRESSURES WHICH HAVE CAUSED CONNECTICUT FARMERS TO SELL THEIR LAND. THE PROBLEMS OF CONNECTICUT'S FARMERS ARE CAUSED BY EXTERNAL, SOCIAL AND ECONOMIC FACTORS OVER WHICH INDIVIDUAL FARMERS OFTEN HAVE LITTLE CONTROL. THE MOST OBVIOUS, AND PERHAPS MOST IMPORTANT, IS THE RAPID RISE IN THE DOLLAR VALUE OF LAND. COMPETITION FOR LAND IS INTENSE. THE DEMAND FOR A LIMITED SUPPLY OF LAND IS HIGH. MARKET VALUES FOR SOME LAND IN CONNECTICUT HAS RISEN 100 PERCENT BETWEEN 1967 AND 1974. THIS PLACES TREMENDOUS PRESSURE ON FARMLAND, PARTICULARLY ON THOSE FARMS NEAR GROWTH AREAS OF THE STATE.

CLOSELY RELATED TO RISING LAND VALUES IS THE ISSUE OF PROPERTY TAXATION. IN 1973 THE CONNECTICUT LEGISLATURE HAD THE FORESIGHT TO PASS P.A. 490 TO PROVIDE USE TAXATION OF OPEN SPACE. TAXES LEVIED ON LAND IS BASED ON ACTUAL USE. MOST LAND IN CONNECTICUT IS TAXED AT HIGHEST OR BEST POTENTIAL USE. BEST USE MEANS HIGHEST ECONOMIC USE. UNDER P.A. 490, FARMERS AND OTHER OWNERS OF OPEN SPACE MAY APPLY FOR A USE-VALUE ASSESSMENT WHICH CAN MEAN A SIGNIFICANT REDUCTION IN LAND TAX. THE REDUCTION IN PROPERTY TAX HAS HELPED MANY FARMERS STAY IN BUSINESS. BUT THIS IS ONLY PART OF THE STORY. PARTICIPATION IN THE P.A. 490 PROGRAM DEPENDS ON TOWNS' PARTICIPATION IN THE STATEWIDE PROGRAM. UNFORTUNATELY NOT ALL TOWNS PARTICIPATE. IN ADDITION TO LAND TAXES, A BIG TAX BITE OFTEN COMES ON FARM BUILDINGS AND EQUIPMENT. MANY LOCAL ASSESSORS MAKE UP SOME OF THE LOSS IN REDUCED LAND TAX REVENUE BY ASSESSING THE BUILDINGS, EQUIPMENT

AND OCCASIONALLY CERTAIN FARM ANIMALS.

THE INHERITANCE TAX IS ALSO A MAJOR FACTOR IN THE MAINTENANCE OF INTEGRAL FARMS. FARMERS WITH CHILDREN INTERESTED IN CONTINUING THE BUSINESS MUST PLAN CAREFULLY TO AVOID CRIPPLING FEDERAL AND STATE INHERITANCE TAXES. PART OF THE PROBLEM IS THAT MOST ASSETS OF THE FARMER ARE NOT IN CASH. THE INHERITANCE TAX IS ON ALL ASSETS. IN ORDER TO PAY THE TAX, SPOUSES OR CHILDREN ARE FREQUENTLY FORCED TO SELL LAND OR EQUIPMENT TO RAISE MONEY TO PAY THE TAX. THIS LEADS TO SMALLER DIVIDED FARMS.

FARM PROFITS, IN RECENT YEARS, HAVE BEEN SQUEEZED BY INCREASING FEED PRICES AND HIGHER LABOR COSTS. IN ORDER FOR A DAIRY FARMER TO MAKE A MODEST INCOME IS NECESSARY TO HAVE A MINIMUM HERD OF 80 - 100 COWS. UNFORTUNATELY, A HERD THIS SIZE REQUIRES AN ADDITIONAL EMPLOYEE TO MANAGE THE HERD PROPERLY. FOR THOSE FARMERS WITH FEWER COWS, OUTSIDE INCOME IS NECESSARY. DECLINING PROFITS HAVE MEANT INCREASING PRESSURE TO SELL LAND FOR A PREMIUM PRICE TO REAP A PROFIT.

ANOTHER SERIOUS PROBLEM FOR THE STATE'S AGRICULTURAL INDUSTRY IS THE AVAILABILITY OF LABOR. FOR ORCHARD OWNERS, THE MOST SERIOUS FACTOR THREATENING THEIR EXISTENCE IS THE LACK OF LABORERS TO HARVEST AND PACKAGE FRUIT. IN THE LAST FIVE YEARS, LITTLE LOCAL FARM LABOR HAS BEEN AVAILABLE. IN ORDER TO HARVEST THEIR CROPS, LABOR IS OFTEN IMPORTED FROM JAMAICA OR OTHER COUNTRIES. SHORT TERM LABOR IS ONE ASPECT OF THE LABOR PROBLEM. FINDING SKILLED FARM HELP FOR LONG TERM EMPLOYMENT IS INCREASINGLY DIFFICULT AND EXPENSIVE.

ANOTHER FACTOR, THOUGH LESS OF A PROBLEM, HAS MADE EXISTENCE TOUGHER FOR FARMERS. THIS IS THE NEW PUBLIC CONCERN OVER ENVIRONMENTAL DEGRADATION AND NEW ENVIRONMENTAL REGULATIONS. THE PROBLEMS OF DISPOSING OF ANIMAL WASTES, STREAM SILTATION FROM CULTIVATION, PESTICIDE SIDE EFFECTS AND NITROGEN PHOSPHATE CONTAMINATION OF NEARBY BODIES OF WATER BY FERTILIZERS ARE SIGNIFICANT ENVIRONMENTAL ISSUES. THE REGULATIONS DESIGNED TO DEAL WITH THESE PROBLEMS HAVE REDUCED FARM YIELDS, INCREASED COSTS AND INCREASED THE RED-TAPE FARMERS MUST CONTEND WITH.

INTERESTINGLY, THE FARMER'S NEW SUBURBAN NEIGHBORS HAVE BECOME ONE OF THEIR MOST AGGRAVATING PROBLEMS. THE NEW RESIDENTS SUDDENLY FEEL THAT THEIR "RIGHTS" ARE IMPINGED UPON WHEN THEY ENCOUNTER A SLOW TRACTOR ON A ROAD, THE SMELL OF FRESH MANURE WAFTS ACROSS THEIR PROPERTY, OR TRACTOR NOISE DISTURBS THEIR WEEKEND TRANQUILITY. THESE NEW NEIGHBORS ARE OFTEN IN THE FOREFRONT, PROPOSING NEW LOCAL ORDINANCES THAT INTERFERE WITH NECESSARY FARMING ACTIVITIES.

THE NEXT PART OF THE UNIT WILL INVOLVE THE USE OF GUIDE SHEET # 13 AND 14. GUIDE SHEET #13 IS AN ARTICLE ENTITLED THE VANISHING LAND. THE ARTICLE HAS BEEN PUBLISHED AS A CONNECTICUT CONSERVATION ASSOCIATION WHITE PAPER. IT IS AN ELOQUENT AND WELL DOCUMENTED CASE FOR ACTION TO PRESERVE CONNECTICUTS AGRICULTURAL LAND. ON GUIDE SHEETS # 14 YOU WILL FIND AN ACTIVITY TO ACCOMPANY THE ARTICLE. BE SURE TO READ THE ACTIVITY

G.S. #13
& #14

ON GUIDE SHEET # 14 BEFORE READING THE VANISHING LAND. TURN THE TAPE RECORDER OFF WHILE YOU READ THE VANISHING LAND AND COMPLETE THE ACTIVITY ON GUIDE SHEET #14. (PAUSE)

AS I READ THE VANISHING LAND, I ALSO WORKED OUT THE ACTIVITY ON GUIDE SHEET # 14 . . . IF YOU WANT TO COMPARE NOTES, YOU WILL FIND MY RESULTS ON GUIDE SHEET # 15. IF YOU WANT SOME TIME TO STUDY MY RESPONSES, TURN OFF THE RECORDER . . . (PAUSE)

G.S. #15

IN RECOGNITION OF THE ISSUES SO FORCEFULLY PRESENTED IN THE VANISHING LAND A STATEWIDE COMMISSION WAS APPOINTED BY THE GOVERNOR IN 1974 TO STUDY THE PROBLEMS OF AGRICULTURE IN CONNECTICUT. A SUMMARY REPORT OF THE COMMISSION, KNOWN AS THE GOVERNOR'S TASK FORCE FOR THE PRESERVATION OF AGRICULTURAL LAND, IS INCLUDED AS GUIDE SHEET # 16. AS YOU READ THE REPORT, COMPARE THE STATEMENTS AND RECOMMENDATIONS OF THE TASK FORCE WITH THE LIST OF PROBLEMS AND SUGGESTED SOLUTIONS LIST YOU MADE AS YOU WERE READING THE VANISHING LAND. TURN OFF THE TAPE RECORDER WHILE YOU READ THE GOVERNOR'S TASK FORCE REPORT . . . WHEN YOU FINISH READING THE REPORT, TURN THE RECORDER BACK ON. (PAUSE)

G.S. #16

AS YOU REVIEWED THE ALTERNATIVE POLICIES PRESENTED BY THE TASK FORCE ON THE LAST PAGE OF THE REPORT, DID YOU FIND AN ALTERNATIVE WHICH YOU FEEL WOULD PROVIDE AN EQUITABLE PROCEDURE FOR PRESERVING AGRICULTURAL LAND? DO YOU FEEL THERE IS A BETTER ALTERNATIVE? IF SO, WRITE IT DOWN AND USE IT FOR DISCUSSION LATER! HOW WOULD YOU FINANCE A PROGRAM DESIGNED TO PRESERVE AGRICULTURAL LAND?

IN SUMMARY, WE MIGHT POINT OUT THAT, WHILE NOT NATIONALLY IMPORTANT CONNECTICUT'S FARMS DO CONSTITUTE AN IMPORTANT AID TO THE STATE'S ECONOMY, AND, ADDITIONALLY, THE FARM PRODUCTION OFFERS AN IMPORTANT LOCAL FOOD SOURCE IN VIEW OF THE POSSIBILITY OF FUTURE FOOD AND ENERGY SHORTAGES. THE REMAINING FARM ACREAGE IS ENDANGERED BY INCREASING URBANIZATION AND ECONOMIC PRESSURES.

YOU MAY NOW BE AWARE THAT SUCH UPLAND AREAS AS FARMS AND FORESTS ARE VALUABLE. IN FACT, THEY CONSTITUTE AN IMPORTANT RESOURCE. LIKE ANY RESOURCE, THEIR USE SHOULD BE CAREFULLY PLANNED AND MANAGED. UNFORTUNATELY, SOME OF THE MOST VALUABLE OF THESE NATURAL RESOURCES ARE RAPIDLY DISAPPEARING, THE VICTIMS OF URBAN SPRAWL AND ECONOMIC EXPLOITATION. EACH YEAR MORE FARMS GO OUT OF BUSINESS. THEY ARE SOLD OFF TO INDUSTRIAL AND HOUSING DEVELOPERS OR LAND SPECULATORS. FARMLAND IS GOOD QUALITY LAND WHICH CAN BE READILY UTILIZED FOR DEVELOPMENT. THE DEVELOPMENTS IN TURN CAN PROVIDE SOLID BENEFITS IN THE LOCAL AREA BOTH IN TAX RETURNS AND EMPLOYMENT.

MOST MODIFICATIONS OF UPLAND AREAS HAVE A NEGATIVE EFFECT UPON THE NATURAL FUNCTIONS OF THE UPLAND ECOSYSTEM. A SUMMARY OF ACTIVITIES CARRIED OUT IN UPLAND AREAS AND THEIR IMPACT IS PRESENTED IN THE FORM OF A MATRIX ON GUIDE SHEET # 17. STOP THE RECORDER WHILE YOU STUDY GUIDE SHEET # 17. . .

G.S. #17

WELL, WE HAVE CONSIDERED FORESTS AND FARMS IN UPLAND AREAS . . . BECAUSE UPLAND AREAS ARE SO SIMPLY AND IRREVOCABLY CONVERTED, CONVINCING REASONS MUST BE FORWARDED

IN SUPPORT OF THEIR CAREFUL MANAGEMENT AND/OR PRESERVATION. IN SHORT OF WHAT USE ARE UPLAND AREAS? OF WHAT USE IS A FOREST OR FARM? UNDER WHAT CIRCUMSTANCES ARE THE HOUSING AND INDUSTRIAL NEEDS OF THE STATE GREAT ENOUGH TO WARRANT THE LOSS OF THE UPLAND AREAS INVOLVED?

WE HAVE SUMMARIZED MANY OF THE VALUES OF UPLANDS - BOTH FARM AND FOREST ON GUIDE SHEET # 18. THE LIST OF ESSENTIAL FUNCTIONS THAT UPLANDS PERFORM IS EXTENSIVE. BEFORE YOU TURN THE RECORDER OFF TO READ THE FINAL GUIDE SHEET, REMEMBER, THE AESTHETIC VALUE OF FARMS AND FORESTS ARE BEST EXPERIENCED RATHER THAN DESCRIBED. PLAN TO TAKE A RELAXED DRIVE THROUGH THE COUNTRYSIDE AND EXPERIENCE FIRST HAND THE REAL VALUE OF CONNECTICUT'S UPLANDS.

THANK YOU FOR JOINING US.

TURN THE RECORDER OFF AND REVIEW GUIDE SHEET # 18,

G.S. #18